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Being an Expansion of a Lecture delivered at a Special Meeting of the Royal Society of Medicine on Nov. 30th, 1922,

BY SIR ALMROTH E. WRIGHT, M.D., F.R.S.

PART II.*

WE are now in a position to examine in more detail the nature of epiphylactic response. Certain very simple reconnoitring experiments give us our bearings. The experiments in question consist in killing the leucocytes, in some cases before, in other cases after, implanting microbes into the blood and seeing how far this killing of leucocytes affects bacterial destruction. An illustrative experiment is subjoined. Here before the microbes were implanted, the blood was heated to a temperature of 46° C.–48° C., this being a temperature which kills the leucocytes and leaves the serum, and if not kept up unduly long, also the microbes unaffected.

Here graduated implantations of staphylococcus were made by the "wash and after-wash" method into a series of volumes of A. E. W.'s blood, these volumes being drawn up one after the other into a long-stemmed capillary tube.

—		Number of colonies which developed in vols.														Total in the last 12 vols.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	(1)..	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	(2)..	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	(1)..	+	+	+	3	3	2	1	1	0	1	0	1	1	0	0	13
	(2)..	+	+	+	5	5	2	0	0	0	0	1	0	0	0	0	13

A = Unheated blood. B = Blood pre-heated to 48° C.
The sign + is employed to indicate that the colonies were too closely packed to allow of accurate enumeration.

It will be clear from this quite typical experiment that the killing of leucocytes makes a very profound difference. The pre-heating of the blood abolishes or nearly abolishes, in two several ways, the bactericidal power of the blood for staphylococci and streptococci. First, it puts an end to phagocytic action (in the case of my own blood that would apparently not count for much); and further (and this in all bloods counts for a great deal more) it abolishes also the power of epiphylactic response, the blood being then left with only such microbicidal powers as it possessed ab origine. With respect to the experiments in which the blood, after microbes have been implanted, is heated sufficiently to kill the leucocytes and not sufficiently to affect the serum or injure the implanted microbes, these experiments give, as you will expect to hear, results which are in absolute agreement with those obtained in implanting and explanting experiments. When we implant into a blood and then immediately apply a temperature of 46°–48° C. we obtain very much less growth than in an ante-heated blood. Appreciably more microbes are killed when we apply heat after the lapse of even a minute, and when, before heating, the implanted blood is allowed to lie upon the bench for an hour or so, the cultural results are practically the same as in a blood which is left unheated.

EXPERIMENTS WHICH SHOW THAT WHEN EPIPHYLACTIC RESPONSE IS EVOKED IN THE BLOOD THE BACTERICIDAL POWER OF THE SERUM IS INCREASED.

Such experiments as those cited in which the blood is heated either before or after the implantation of microbes are, it must be remembered, only reconnoitring experiments. They do not make it absolutely certain that it is by the action of the leucocytes or almost exclusively by their action that staphylococci and streptococci are killed in the blood. And again, these heating experiments—and the same applies, of course, to all experiments made with the whole blood—tell us nothing except by way of indirect inference with regard to the manner in which the killing of the microbes is accomplished. To arrive at certain knowledge we must experiment with each of the elements of the blood separately.

We may advantageously begin by satisfying ourselves that epiphylactic response goes hand in hand with a development of increased bactericidal power in the serum. As I have already elsewhere[1] shown that this holds true of human blood vaccinated in vitro, I may profitably here cite experiments of a different kind—experiments in which vaccines of dead microbes are inoculated intravenously into animals and man, and experiments in which the sera are tested immediately and at different time-intervals after inoculation.

EXPERIMENTS ON RABBITS.

Here a vaccine of dead microbes was inoculated intravenously, samples of blood were withdrawn before and at intervals after inoculation, and then similar implantations of living staphylococci were by the wash and after-wash method made into a sequence of 10 c.mm. volumes of each serum. The figures in the table show the number of staphylococci which grew out into colonies in the different sequences of 10 c.mm. volumes—the numbers being in each case expressed in terms of microbes per c.cm. of serum.

Rabbit.	Microbes per c.cm. which grew out into colonies in sera of bloods drawn off before and after injection of vaccine.							Additional number of microbes killed by the serum after injection of vaccine.
	Before	1 min. after	15 min. after	30 min. after	1 hr. after	3 hrs. after	6 hrs. after	
1. Inoculated with 20,000 staph. per c.cm. of blood ..	5000	100	—	100	—	0	0	At least 5000 per c.cm.
2. Inoculated as Rabbit 1	2200	1200	200	—	—	400	0	At least 2200 per c.cm.
3. Inoculated with 14,000 streptococcus pyogenes per c.cm. of blood ..	5000	500	0	—	0	—	0	At least 5000 per c.cm.

Staph. = Staphylococci.

EXPERIMENTS ON MAN.

I. Here 250,000 dead streptococci—i.e., about 40 streptococci per c.cm.—were injected intravenously into A. E. W.'s blood, samples of blood were drawn off before and after the injection, and the bactericidal powers of the sera were tested by implanting by the wash and after-wash method graduated doses of living staphylococci into a sequence of equal volumes of serum, filled in each case into a long capillary tube.

—		Positive or negative result of culture in successive unit-vols. of serum.															Number of vols. which showed growth.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1.	(a)..	+	+	+	+	+	+	+	+	+	+	?	?	+	+	+	13 } 14
	(b)..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	15 }
2.	(a)..	+	+	+	+	+	+	+	0	0	0	0	0	0	0	0	7 } 8
	(b)..	+	+	+	+	+	+	+	+	+	0	0	0	0	0	0	9 }
3.	(a)..	+	+	+	+	+	+	0	0	0	0	0	0	0	0	0	6 } 6½
	(b)..	+	+	+	+	+	+	0	0	0	0	0	0	0	0	0	7 }

1. Serum immediately before injection.
2. Serum 2 min. after injection.
3. Serum 15 min. after injection.

* Part I. appeared in THE LANCET of Feb. 24th.

[1] Comptes Rendus Académie des Sciences, October, 1918; THE LANCET, March 29th, 1919, p. 489.

II. Here a dose of streptococcus vaccine equivalent to some 15 streptococci per c.cm. of circulating blood was inoculated intravenously into a patient suffering from a streptococcus infection. Samples of blood were taken immediately before, immediately after, and 24 hours after the injection. The sera were tested by implanting with living staphylococci by the "wash and after-wash" method in each case into a sequence of one 20 c.mm. and two 10 c.mm. volumes of serum.

—	Number of colonies which developed in—			
	Vol. 1.	Vol. 2.	Vol. 3.	In the 3 vols.
Serum of blood before inoculation (a)	11	1	1	13 } 13·5
Serum of blood before inoculation (b)	13	1	0	14 }
Serum of blood immediately after inoculation (a)	8	1	0	9 } 7
Serum of blood immediately after inoculation (b)	5	0	0	5 }
Serum 24 hours after (a)	15	0	0	15 } 14
Serum 24 hours after (b)	13	0	0	13 }

The difference of 6·5 colonies in 40 c.mm. of serum corresponds to a killing of 162 more staphylococci per c.cm. of serum.

III. Here a dose of vaccine corresponding to about 15 streptococci per c.cm. of circulating blood was inoculated intravenously into a patient suffering from a heavy cold, followed by a further intravenous injection of 10 streptococci per c.cm. of blood 24 hours after, when the cold was decidedly better.

The sera were tested by implanting 5 c.mm. of a staphylococcus suspension into 100 c.mm. volumes of serum.

August 23rd, 1922: Serum before inoc. furnishes 76 staph. colonies.
Serum immediately after inoc. furnishes 63 staph. colonies.
The difference of 13 colonies per 100 c.mm. corresponds to a killing of 130 more staphylococci per c.cm. of serum.

August 24th, 1922: The sera were here tested in the same way but, of course, with a different staphylococcus suspension.
Serum immediately before inoc. furnishes 40 colonies.
" " after " " 30 "
" 24 hours " " " 40 "
The difference of 10 colonies in 100 c.mm. corresponds to a killing of 100 more staphylococci per c.cm.

IV. Intravenous inoculation of a streptococcus vaccine into a normal man.

May 10th, 1922: 500,000 dead streptococci were inoculated, and the sera were tested by implanting a 20 c.mm. wash of a staphylococcus suspension in each case into three 20 c.mm. volumes of serum.
The volumes of serum immediately before inoculation furnished—
36, 38, and 30 colonies—average 35.
Those of serum after inoculation furnished—
27, 34, and 29 colonies—average 30.
Those of serum 20 hours after inoculation furnished—
23 and 28 colonies—average 25.

May 15th, 1922: 800,000 dead streptococci were inoculated. The sera were tested as before.
The volumes of serum immediately before inoculation furnished—
13, 16, and 9 colonies—average 13.
The volumes of serum after inoculation furnished—
7 and 8 colonies—average 7·5.
The volumes of serum 24 hours after inoculation furnished—
16 and 19 colonies—average 17·5.
Calculation shows that the blood immediately after the first inoculation killed 250 more staphylococci per c.cm., and 20 hours after 500 more per c.cm.; and that it killed immediately after the second inoculation 275 more per c.cm.

V. Intravenous inoculation of streptococcus vaccine into a normal man.

Dec. 29th, 1922: Sera from bloods drawn off before, 1½ hours after, and 5 hours after the inoculation of 160,000 dead staphylococci; 50 c.mm. volumes of each serum were implanted with 2·5 c.mm. of a 2700-fold dilution of a broth culture of staphylococcus.
Serum before inoculation furnished 47 colonies.
Serum 1½ hours after " " 21 "
Serum 5 hours after " " 42 "
Calculation here shows that the serum 1½ hours after inoculation kills 520 more staphylococci than before.

VI. Streptococcus endocarditis.

Sept. 16th, 1922: Sera from bloods drawn off before and immediately after an intravenous inoculation of 25,000 dead staphylococci. The technique employed and the staphylococcus suspensions employed were the same as in the last case.
Serum Before Inoculation.—Implanted with the more dilute suspension of staphylococcus furnishes 35 and 48 colonies (average 40·5); implanted with the more concentrated suspension 71 and 83 colonies (average 77).
Serum Immediately After Inoculation.—Implanted with the more dilute suspension furnishes 32 and 34 colonies (average 33); implanted with the more concentrated suspension 65 and 66 colonies (average 65½).

This, taking again the figures for the heavier implantation, works out as an increased killing of 11·5 per 50 c.mm. and 230 for 1 c.cm. of serum.

EXPERIMENTS WHICH SHOW THAT THE VACCINATION OF BLOOD MAY INCREASE THE OPSONIC POWER OF SERUM AND ALSO THE PHAGOCYTIC POWER OF BLOOD.

Let me now go on to show that when epiphylactic response is evoked in the blood the opsonic power of the serum, and pari passu with this, if the phagocytic efficiency of the leucocytes is not reduced, the phagocytic power of the blood is increased.

Reference has already been made to the fact that the inoculation of the blood with bacterial vaccines increases the opsonic power of the serum. This development of opsonic power proceeds on quite similar lines to the development of bactericidal power. It manifests itself both in vitro and in vivo, and it begins practically immediately.

EXPERIMENTS IN WHICH VACCINES WERE INOCULATED INTRAVENOUSLY INTO RABBITS.

Rabbit 1.—Inoculated with 10 million of dead staphylococci (about 40,000 per c.cm.). Opsonic power of serum—before inoculation 1; 3 minutes after, 2·9; 1 hour after, 2·3; 1½ hours after, 3·0.

Rabbit 2.—Inoculated with 5 million of dead staphylococci (about 20,000 per c.cm.). Opsonic power of serum—before inoculation, 1; 3 minutes after, 1·2; 2½ hours after, 1·3.

EXPERIMENTS IN WHICH VACCINES WERE INOCULATED INTO HUMAN BLOOD IN VITRO AND IN VIVO.

I. Intravenous inoculation of about 40 streptococci per c.cm. into A. E. W.'s blood. Blood 1 was drawn immediately before, blood 2 immediately after, and blood 3 15 minutes after inoculation. The opsonic power of the sera and the phagocytic efficiency of the leucocytes were then measured—the opsonic power by taking 1 volume of serum, 1 volume of the staphylococcus suspension, and 1 volume of washed leucocytes; the phagocytic efficiency by comparing the microbic intake obtained by using the same sera with the different leucocytes.

—	Staphylo-phagocytic count.	Staphylo-opsonic index.	Average ingest of the 3 sera.	Phagocytic efficiency.
Washed corps. of blood 1—				
+ serum 1 + staph.	3·4	1	5	1
+ " 2 + "	5·5	1·6		
+ " 3 + "	6	1·8		
Washed corps. of blood 3—				
+ serum 1 + staph.	3·5	1	4	0·8
+ " 2 + "	3·9	1·1		
+ " 3 + "	4·8	1·4		

I want to draw attention here to three points: To the fact that the opsonic index of the blood goes up instantly; to the fact that the phagocytic efficiency of the leucocytes goes down; and to the fact that the effect of the increased opsonic power is in this case partially masked by the decreased leucocytic efficiency. This comes out when we regard serum 3, and note that it gives with the corpuscles of blood 1 an average ingest of 6, and with the corpuscles of blood 3 an ingest of 4·8 only.

We shall presently see that the changes which occur in the blood in acute streptococcic infections follow this pattern except only in the respect that we have there usually a smaller rise in the opsonic index and a much profounder fall in the leucocytic efficiency.

In the next experiment (II.) it will be seen there is: 1. A notable increase of strepto-phagocytic power obtained with both varieties of vaccine. 2. Further, in each case when a certain dose is exceeded the phagocytic power begins again to decline. Other results show that this decline is probably due to the increased opsonic power of the serum being now counterbalanced by a poisoning of the leucocytes. 3. In this particular case a greater rise in the strepto-phagocytic power is obtained with the homologous vaccine. This might, of course, be due to the homologous character of the vaccine, but it might also be due to the dose of streptococcus having been

here more fortunately chosen, either from the point of view of its evoking a better opsonic response, or from the point of view of its being less toxic to leucocytes.

The same probably holds true of all the following experiments. In connexion with the sixth experiment of the series, it will, on comparing the phagocytic indices with the opsonic indices—i.e., on comparing the amount of phagocytosis obtained with the leucocytes of the vaccinated blood with that obtained with the leucocytes of the unvaccinated blood—be seen that increase in the opsonic power of the serum is to a large extent masked by the poisoning or exhaustion of the leucocytes.

II. Here, with a view to finding out what would be the better kind and optimum quantum of vaccine to add to a prospective donor's blood for the purposes of immunotransfusion graduated additions of typhoid and streptococcus vaccines were made to his defibrinated blood in vitro. The samples of blood were incubated with the vaccine for one hour in vitro, and were then tested for phagocytic power by adding one volume of streptococcus suspension to two volumes of defibrinated blood.

—	Streptophagocytic index.	—	Streptophagocytic index.
Unvaccinated blood ..	1	Unvaccinated blood ..	1
Blood vaccinated with typhoid bacilli:		Blood vaccinated with streptococci	
1,000 per c.cm. ..	1·7	20 per c.cm. ..	3·6
2,000 ,, ..	2	40 ,, ..	4
4,000 ,, ..	1·35	80 ,, ..	2
8,000 ,, ..	1·75	200 ,, ..	2·3

III. Here a number of volumes of A. E. W.'s defibrinated blood were inoculated by the wash method with graduated dilutions of staphylococcus vaccine. After incubation for half an hour at 37° C. their phagocytic power was tested with a staphylococcus suspension containing about 200,000,000 staphylococci per c.cm.

—	Staphylophagocytic index.	—	Staphylophagocytic index.
Unvaccinated blood	1	Bloods vaccinated with staph. per c.cm.—	
Bloods vaccinated with staph.—		Circ. 10,000 ..	1·9
Circ. 2,500 per c.cm.	1·3	,, 40,000 ..	2·1
,, 5,000 ,,	1·5	,, 80,000 ..	1·55

IV. Portions of the same blood were inoculated by the same technique with typhoid vaccine, the phagocytic power being afterwards tested with staphylococcus.

—	Staphylophagocytic index.	—	Staphylophagocytic index.
Unvaccinated blood	1	Bloods vaccinated with typhoid bacilli per c.c.—	
Bloods vaccinated with typhoid bacilli—		Circ. 20,000 ..	0·6
Circ. 5,000 per c.cm.	1·4	,, 40,000 ..	0·8
,, 10,000 ,,	1·45		

V. Same donor's blood, same technique, and same typhoid vaccine were employed.

		Staphylo-phagocytic index.
Unvaccinated blood		1
Blood vaccinated with	Circ. 1,500 per c.cm. typhoid bacilli ..	1·65
	,, 3,000 ,, ,, ..	1·7
	,, 6,000 ,, ,, ..	1·0
	,, 12,000 ,, ,, ..	0·85

VI. Same donor's blood, the same technique, and the same typhoid vaccine were employed.

—	Staphylophagocytic index.	—	Staphylo-opsonic index.
Unvaccinated blood ..	1	Serum of unvaccinated blood ..	1
Blood vaccinated with typhoid bacilli—		Serum of blood vaccinated with typhoid bacilli—	
Circ. 4,000 per c.cm.	1·25	Circ. 4,000 per c.c.	1·95
,, 8,000 ,,	1·1	,, 8,000 ,,	1·75

VII. Here a series of volumes of L. C.'s defibrinated blood were implanted with typhoid vaccine and were then immediately centrifugalised. The serum was then quickly pipetted off, and was tested for opsonic power by adding washed corpuscles and staphylococcus suspension.

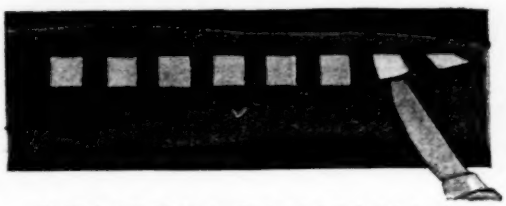
—	Staphylo-opsonic index.	—	Staphylo-opsonic index.
Serum from unvaccinated blood ..	1	Serum from blood vaccinated with typhoid bacilli—	
Serum from blood vaccinated with typhoid bacilli—		12,500 per c.cm.	1·19
		25,000 ,,	1·2
3,000 per c.cm. ..	1·2	50,000 ,,	1·0
6,250 ,, ..	1·38		

It will be seen that here in vitro, as in experiment I. in vivo, opsonic substances are delivered into the blood immediately—that is to say, they are furnished within the time that it takes to separate the serum from the corpuscles.

DERIVATION OF BACTERICIDAL AND OPSONIC SUBSTANCES FROM THE LEUCOCYTES.

The leucocytes provide the bactericidal and the opsonic substances that appear in the serum when epiphylactic response is evoked in the blood. To make sure of this we must first isolate the leucocytes from the other elements of the blood, must then make graduated additions of vaccines to serum (or other

FIG. 4.—A.



Method of making paraffin-framed emigration cells.

B.

Blood imposed on emigration cells.

menstruum), bring this into contact with the leucocytes, and then test its opsonic and bactericidal power. These requirements—and, of course, only the first presents any technical problem—are, as a matter of fact, easily satisfied. The leucocytes can be obtained entirely separate, for they will, if provided with facilities for doing so, emigrate from the blood. All they require is congenial warmth, a meshwork of fibrin to travel along, and a firm surface—such, for example, as the glass floor of an "emigration cell" or the walls of a capillary pipette—to collect upon.

Where emigration cells, such as are shown in Fig. 4 A are employed, these are, as in Fig. 4 B, filled brim full with blood taken direct from the finger.[1] After incubation in a moist chamber for one-half to three-quarters of an hour the clots are washed off with physiological salt solution. Where capillary pipettes are employed, the blood from the finger is drawn up into the stems, these are sealed up at the point, the barrel is then half filled with physiological salt solution, and then the blood is incubated for from half to three-quarters of an hour. After this a

[1] Wright and Colebrook: Technique of the Teat and Capillary Glass Tube, Constable, 1921.

collapsed teat is fitted to the pipette, the tip of the stem is broken across, and the clot is slowly drawn up into the barrel and is then evacuated through the butt end along with the salt solution.

An emigration cell whose floor is coated with emigrated leucocytes may conveniently be called a *carpeted cell*, and a capillary tube similarly coated may be called a *lined tube*—the terms *uncarpeted* and *unlined* would then serve to denote control cells and capillary tubes with blank floors and walls.

The following experiments were carried out:—

I. Carpeted and uncarpeted emigration cells. A. E. W.'s leucocytes and serum. Here a 70-, a 300-, and a 600-fold dilution were made from a broth culture of staphylococcus. Of the first 5 c.mm. were implanted into 100 c.mm. of serum, and of the second and third 2·5 c.mm. into 50 c.mm. In each case half of the implanted serum was imposed on a carpeted and half on an uncarpeted cell. The two portions of serum were then, after a fixed interval, during which they were kept in a moist chamber on the bench, aspirated into fine capillary pipettes. These pipettes were then incubated for 24 hours, and the colonies which developed were counted.

(1) Serum with the heaviest implantation (which works out as 2200 staphylococci per c.cm.).

		Colonies.
25 c.mm.	placed on an uncarpeted cell and immediately re-aspirated furnished	52
		56
25 c.mm.	placed on a carpeted cell and re-aspirated after 45 mins. furnished	26
		15

(2) Serum with the intermediate implantation (which works out as 520 staphylococci per c.cm.).

		Colonies.
25 c.mm.	placed on an uncarpeted cell and re-aspirated after 45 mins. furnished	13
25 c.mm.	placed on a carpeted cell and re-aspirated after 45 mins. furnished	7

(3) Serum with the lightest implantation (which works out as 160 staphylococci per c.cm.).

		Colonies.
25 c.mm.	placed on an uncarpeted cell and re-aspirated after 45 mins. furnished	4
25 c.mm.	placed on a carpeted cell and re-aspirated after 45 mins. furnished	2

(4) A supplementary volume of serum with the same implantation as in (2).

		Colonies.
25 c.mm.	imposed on an uncarpeted cell and re-aspirated after 45 mins. furnished	14
25 c.mm.	imposed on the carpeted cell employed in (1) and re-aspirated after 45 mins. furnished	2

II. Carpeted and uncarpeted emigration cells. I. F.'s leucocytes and serum. Same technique.

Serum implanted with circ. 4800 staphylococci per c.cm. imposed on an *uncarpeted* cell and aspirated after 5 mins. furnished innumerable colonies.
Serum implanted with circ. 4800 staphylococci per c.cm. imposed on a *carpeted* cell and aspirated after 5 mins. furnished 79 colonies.

Serum implanted with circ. 1200 staphylococci per c.cm. imposed on an *uncarpeted* cell for 5 mins. furnished 30 colonies.
Serum implanted with circ. 1200 staphylococci per c.cm. imposed on a *carpeted* cell for 5 mins. furnished 14 colonies.

Seru n implanted with circ. 520 staphylococci per c.cm. imposed on an *uncarpeted* cell for 5 mins. furnished 13 colonies.
Serum implanted with circ. 520 staphylococci per c.cm. imposed on a *carpeted* cell for 5 mins. furnished 2 colonies.

The possibility that the diminution in the number of microbes in the serum which had been imposed upon carpeted cells might be due to a percentage of the microbes sticking to the leucocytes is negatived by considering the effect of implanting in duplicate into broth progressive dilutions of a staphylococcus culture, and explanting the one series of volumes directly, and the other after imposition upon carpeted cells. An experiment of this kind gave the following result:—

Series of volumes of broth explanted directly on to agar gave 33, 14, 7, 5, and 4 colonies—in all 63 colonies.
A similar series explanted on agar after imposition on a carpeted cell gave 33, 20, 10, 2, and 1 colony—in all 66 colonies.

III. Carpeted and uncarpeted emigration cells, and also lined and unlined capillary pipettes. A. E. W.'s leucocytes and 30 c.mm. volumes of serum. A 120-, a 240-, a 480-, and a 960-fold dilution were made of a broth culture of staphylococcus. 2·5 c.mm. volumes of the last two dilutions were implanted into 50 c.mm. volumes of broth which were then aspirated into very fine capillary tubes. The two heavier implanted volumes furnished 55 and 54 colonies; (a similarly implanted volume of serum furnished 47). The two more lightly implanted volumes of broth furnished 25 and 27 colonies.

A series of 30 c.mm. volumes of serum were now implanted with 2·5 c.mm. of the different staphylococcus suspensions; were then imposed in each case for 30 minutes on carpeted emigration cells, and then drawn up into capillary tubes and incubated.

Vol. 1 implanted from the 120-fold dilution of staph. (i.e., with about 220 staph.) furnished 106
Vol. 2 implanted from the 240-fold dilution of staph. (i.e., with about 110 staph.) furnished 25
Vol. 3 implanted from the 480-fold dilution of staph. (i.e., with about 55 staph.) furnished.. 29
Vol. 4 implanted from the 480-fold dilution of staph. (i.e., with about 55 staph.) furnished.. .. .. 27 } 28
Vol. 5 implanted from the 960-fold dilution of staph. (i.e., with about 28 staph.) furnished.. 22
Vol. 6 implanted from the 960-fold dilution of staph. (i.e., with about 28 staph.) furnished.. .. .. 16 } 19

Calculation shows that here with an implantation of about 7500 staphylococci per c.cm. we have a killing of 50 per cent., with an implant of about 3600 a killing of 77 per cent., with an implant of 1800 a killing of 50 per cent., and with an implant of 900 a killing of only 27 per cent.

Supplementary Experiment.—Three 50 c.mm. volumes of serum, implanted respectively with 2·5 c.mm. of the 120-, 240-, and 480-fold dilution of the staphylococcus culture, were drawn up into lined capillary tubes. All these volumes remained sterile. This, if we take the figures for the heaviest implantation, works out as equivalent to the killing of 7200 staphylococci per c.cm. by the leucocytes obtained from 1 c.cm. of blood.

IV. Lined and unlined capillary pipettes. A. E. W.'s leucocytes and 40 c.mm. volumes of his serum. A 150-, a 300-, a 600-, a 1200, a 2400-, and a 4800-fold dilution were made of a staphylococcus broth culture.

2·5 c.mm. of the 4800-fold dilution gave in serum in *unlined* tubes 17 and 18 colonies.
2·5 c.mm. of the 2400-fold dilution gave in serum in *lined* tubes 15 and 17 colonies. In *unlined* tubes in serum 27 and 31 colonies and in an *unlined* tube in broth 31 colonies.
2·5 c.mm. of the 1200-fold dilution gave in serum in *lined* tubes 19 and 15 colonies, as compared with a calculated number of 60 for serum in an *unlined* tube.
2·5 c.mm. of the 600-fold dilution gave in serum in a *lined* tube 21 colonies, as compared with a calculated number of 120 for serum in an *unlined* tube.
2·5 c.mm. of the 300-fold dilution gave in serum in a *lined* tube 15 colonies, as compared with a calculated number of 240 for serum in an *unlined* tube.
2·5 c.mm. of a 150-fold dilution gave in serum in a *lined* tube 10 colonies, as compared with a calculated number of 480 for serum in an *unlined* tube.

In the case of the lined tubes the colonies that grew were in each case confined to the very narrow distal end of the capillary stem where the lining of leucocytes was probably deficient. Taking the figures for the most heavily implanted serum as they stand they testify to a killing of 63 per cent. with an implantation of 750 staphylococci per c.cm., a killing of 72 per cent. with an implant of 1500 per c.cm., a killing of 82·5 per cent. with an implant of 3000 per c.cm., a killing of 94 per cent. with an implant of 6000 per c.cm., and a killing of 98 per cent. with an implant of 12,000 per c.cm.

V. Lined and unlined capillary pipettes. A. E. W.'s leucocytes and 50 c.mm. volumes of his serum. A 30-, a 150-, a 300-, a 600-, and a 2400-fold dilution were made of a broth culture of staphylococcus.

2·5 c.mm. of the 2400-fold dilution gave in serum in a *lined* tube 0 colonies, in *unlined* tubes 6 and 10 colonies.
2·5 c.mm. of the 600-fold dilution gave in serum in a *lined* tube 6 colonies, as compared with 27 in an *unlined* tube.
2·5 c.mm. of the 300-fold dilution gave in serum in a *lined* tube 7 colonies, as compared with a calculated number of 54 for serum in an *unlined* tube.
2·5 c.mm. of the 150-fold dilution gave in serum in a *lined* tube 0 colonies, as against a calculated number of 108 for serum in an *unlined* tube.
2·5 c.mm. of the 30-fold dilution gave in serum in a *lined* tube 100 colonies, as compared with a calculated number of 500 for serum in an *unlined* tube.

Here again the colonies (except in the heaviest implanted serum where they were distributed over the whole length) were all confined to the distal extremity of the pipette.

Leaving this out of consideration and taking the figures as they stand calculation shows that with an implantation of 10,000 staphylococci per c.cm., 80 per cent. were killed; with an implant of 2000, 100 per cent.; with an implant of 1000, 87 per cent.; and with an implant of 560, 78 per cent.

We thus see that the laws governing epiphylactic response are the same for the leucocytes and serum as for the whole blood. Instead of obtaining with increasing implantations progressively less efficient killing (as we inevitably should if the bactericidal power were not enhanced by epiphylactic response) we obtain with increasing implantations (up to a certain limit) more and more effective killing.

I have now come to the end of what I have to say about the modus operandi of vaccines.

(To be concluded.)

THE TREATMENT OF MENORRHAGIA BY RADIUM.

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HÆMORRHAGE from the uterus has now been treated by the intra-uterine application of radium in a sufficient number of cases to enable us to form a judgment as to the class of case for which it is suitable and the results which may be obtained. Radium can be used for the treatment of menorrhagia in three conditions—viz., cases in which the bleeding is associated with the menopause, cases in which it is due to the presence of small fibromyomata in the uterus, and cases in which it occurs in young women who present no signs of general or pelvic disease. Excessive hæmorrhage at the menopause is not uncommon and the loss may be so marked as to give rise to a high degree of anæmia. In the great majority of these cases the bleeding ceases spontaneously sooner or later, and no special treatment is called for, but in other cases the loss of blood is so great that it is necessary to take steps to arrest it. In this variety medicinal remedies have very little effect, and in the worst cases such measures as plugging the vagina or the cavity of the uterus, temporarily closing the cervical canal with sutures, or even hysterectomy, may have to be resorted to to arrest the bleeding. All these cases can be safely and efficiently treated by the intra-uterine application of radium, and this should always be employed in preference to any of the other measures when radium is available.

Problem of Excessive Hæmorrhage at the Menopause.

Whether we regard this excessive hæmorrhage at the menopause as due to some disturbance of the secretions of the internal glands, or to premature senility of the uterus resulting in an excess of fibrous tissue in its walls, the so-called fibrotic uterus of some writers, radium is equally applicable and certain in its results. It is a possible but unproven hypothesis that women who lose severely at the climacteric are the possessors of unduly fibrotic uteri which have undergone early and excessive senile changes, and that the presence of such an excess of fibrous tissue is the explanation of the fact that without any apparent cause some women bleed excessively at this period of life, while other women pass through the change without any disturbance in the regularity of or in the amount of blood lost at their periods. It may well be that women vary in the proportion of fibrous tissue present in their uteri at the menopause just as different individuals vary in the amount of fibrous tissue in the walls of their arteries at the same ages. Such a hypothesis would explain the failure of drugs to arrest the bleeding in these cases, at any rate those drugs which depend for their action on the setting up of uterine contractions.

Limitations of Uses of Radium.

While radium is especially useful in the treatment of excessive hæmorrhage at the menopause, it may also be employed for the arrest of hæmorrhage due to the presence of small fibromyomata in the uterus, or that occurring in young women without any apparent cause. Its use in fibromyomata of the uterus should be strictly limited to small tumours not larger than the uterus at the fifth month of pregnancy; not undergoing any form of degeneration; not complicated by any accompanying disease of the appendages; not causing pressure or other symptoms referable to their size; and not projecting markedly into the interior of the uterus. Within these strict limitations radium gives good results in arresting the bleeding and in ultimately causing shrinkage of the tumours. It should not be employed when the cavity of the uterus is much distorted, and it is wiser not to use it in submucous tumours for fear of injury resulting to the capsule of the tumour which might be followed by infection and sloughing of the growth. Although it is quite possible to bring about arrest of hæmorrhage and shrinkage of the fibromyoma when it is larger than a five months pregnant uterus, yet tumours of this size are best dealt with by operation and are unsuitable for radium treatment.

From time to time severe hæmorrhage occurs from the uterus in young women who are not the subjects of any general or pelvic disease, and whose age excludes the possibility of a premature menopause being a causative factor in the bleeding. In these cases it is common to obtain a history that curettage has been performed unsuccessfully on one or more occasions and that drug treatment has failed. By the intra-uterine application of suitable doses of radium it is possible to produce either complete or temporary amenorrhœa, and if the hæmorrhage returns the procedure can be easily and safely repeated.

Technique of Intra-uterine Application of Radium.

The technique of the intra-uterine application of radium is quite simple. The patient is prepared as for a curettage; under the anæsthetic a careful bimanual examination is made, particular attention being paid to the detection of any disease of the appendages. The cervix is dilated and an exploratory curettage is carried out, the scrapings being carefully preserved for microscopic examination. The interior of the uterus is douched out with hot lotion at a temperature of 118–120° F., and swabbed out with iodine or adrenalin if the bleeding is at all severe. The tube of radium, adequately screened, is introduced into the uterus up to the fundus; it is then withdrawn half an inch and the cervical canal plugged with ribbon gauze to prevent the tube slipping down into the cervix. The vagina is also lightly plugged with gauze. For convenience of withdrawal the ribbon gauze should have a piece of thread attached to it. At the end of the period of treatment the vaginal plug is removed, the cervical plug withdrawn by its thread, and finally the radium tube extracted by the piece of silk or silkworm gut attached to its carrier.

If the cervix has been adequately dilated up to the size of a No. 14 Hegar dilator no difficulty is, as a rule, experienced in withdrawing the tube; if however, any difficulty does occur it can be readily overcome by gentle continuous traction. In some patients the presence of the tube in utero produces marked sickness which persists until it has been removed, and in other women an attack of vomiting occurs at the time the tube is extracted through the cervix. The patient should be kept in bed for four to five days. In the case of a large uterus it may be necessary to use two tubes arranged tandem fashion in the same piece of rubber tubing.

The screen for an intra-uterine application should be such as to cut off all the beta and softer gamma rays so as to allow only the hard penetrating gamma rays to pass and act on the tissues. In the cases recorded in this paper the screens used were composed of 2 mm. of lead and 3 mm. of rubber for radium emanation tubes, and 1 mm. platinum and 2 mm. rubber for tubes containing radium element. Other screens of an equivalent density of gold, aluminium or brass may also be employed. The secondary rays, which are formed in the lead or platinum screen (rays of Sagnac), are effectively filtered off by the use of the 2–3 mm. thick rubber covering. It is desirable in treating cases of the same kind to use similar screens so that accurate comparisons of the results may be attained. One of the objections to the use of radium is that it requires an anæsthetic, but in reality this is an advantage, inasmuch as it allows of a thorough pelvic examination and an exploratory curettage being carried out, important factors in safeguarding the patient from the employment of the method in unsuitable conditions, and in avoiding the possibility of overlooking malignant disease.

Dosage.

The determination of the proper dosage is one of the difficulties in radium treatment. The average dose required in the treatment of hæmorrhage at the menopause may be said to be from 2000–2400 mg. or millicurie hours. In cases of fibromyomata of the uterus such a dose may have to be repeated on one or more occasions, and in the case of young women in whom it is desired to produce only partial or temporary amenorrhœa the amount used should be smaller, or, if the same, should be applied for a shorter period of time. Different patients, especially young women, appear to react to the same dose in very varying degrees, that is, exhibit different degrees of so-called "radio-sensibility," and it is therefore not always easy to determine the exact dose which will bring about a complete arrest of the periods, temporary arrest for varying periods of time, or only a diminution in the amount of blood lost. With increasing experience, however, we shall be better able to determine the exact dose required to bring about any desired effect. It is still a matter of difference of opinion whether the best results are obtained by the use of large doses for a short period of time or of smaller doses employed for a longer period of time, or repeated on one or more occasions. It is important to avoid any skin reaction, and at the same time it must be remembered that the age of the uterus does not always correspond to the age of the patient, and patients of similar ages may react very differently to the same dose of radium.

The terms "milligramme hours," and "millicurie hours" have been introduced by Dawson Turner to indicate the duration of the exposure. In these terms the dose is expressed by multiplying the number of milligrammes of radium element, or the numbers of millicuries of radium emanation used, by the time in hours of the exposure. While this method is not strictly accurate it provides a fair estimate of the effective dose employed, if at the same time the nature of the screens and the distance from the surface of the skin when the application is made externally are also given. The activity of a millicurie of radium emanation in gamma rays corresponds to the gamma ray activity of a milligramme of radium element.

In using radium emanations due allowance must be made for the gradual decay of the emanation, amounting, roughly, to three-quarters of 1 per cent. per hour. For clinical purposes it is sufficiently accurate to assume that 100 mg. applied for one hour or a dose of 100 mg. hours produces the same biologic effect as 50 mg. applied for two hours. Radium should never be introduced into the uterus in any case in which there are signs of inflammation of any part of the genital tract, and great care must be taken to exclude disease of the uterine appendages. For this reason a careful bimanual examination of the pelvis should be practised before the tube is introduced, and the interior of the uterus explored so as to exclude with certainty the possibility of any malignant disease.

Immediate Results.

It is best, whenever possible, to carry out the treatment at a time when the patient is not actually bleeding. The intra-uterine application of radium with proper technique in carefully selected cases may be said to be free from any danger. If it is used in cases of chronic pelvic peritonitis it may set up an acute attack, but the same result may follow any other pelvic procedure in such a case. The method does not, as a rule, give rise to any marked pain; some patients complain of general discomfort in the lower abdomen, and in others, after the sickness due to the anæsthetic has passed off, nausea may be complained of or vomiting may even persist until the tube has been removed. No rise of temperature occurs in an uncomplicated case, such as so often follows the use of radium in carcinoma of the uterus.

In a certain number of the cases complete amenorrhœa follows the treatment immediately, in others one or two often excessive losses occur before the cessation of the periods is brought about. This is more likely to be the case in young women or in those with fibromyomata of the uterus rather than in women at the menopause. In a few cases troublesome leucorrhœa or a slightly blood-stained discharge lasts for some four to six weeks, rarely for some months. It appears to result from the local destructive action of the radium on the endometrium, and is more likely to follow the use of large doses.

If the treatment brings about the complete cessation of the periods the minor symptoms of the menopause, such as flushings, usually follow. In cases in which the periods return after an interval it is not uncommon to find that the flushings have ceased simultaneously, and the administration of a second dose, if followed by amenorrhœa, will again cause the onset of these vaso-motor disturbances.

The excessive bleeding which not infrequently immediately follows the radium treatment has been ascribed to the liberation of hormones brought about by the destruction of Graafian follicles in the ovaries by the radium. In the majority of patients the cessation of the periods is followed by an improvement in the general health. Occasionally severe nervous symptoms may ensue on the menopause; thus, one of my patients, who before treatment suffered from extreme attacks of depression at the periods, which were excessive, has since their cessation developed severe melancholia and religious mania. In this case a dose of 2700 millicurie hours internally and one of 1320 millicurie hours externally brought about an arrest of the bleeding after four periods. In three cases radium burns with vesication and superficial ulceration followed the external application of large doses of radium applied over the ovarian regions. In these cases the doses used were 540, 1000, and 1100 millicurie hours, the emanation being screened with 2 mm. of lead, 3 mm. of rubber, and three thicknesses of lint. It has been calculated that the uterus will stand a dose three times greater than that required to produce a skin reaction, and in applying radium over the ovarian region it is most important to follow the technique suggested by Simpson and by means of suitable pads to distribute the radium used over a plane surface of sufficient size, and to place it at a sufficient distance from the skin to obviate any risk of causing injury to the superficial tissues.

Is Damage Brought About by Radium Treatment?

It has been suggested that the damage done by so powerful an agent as radium to the tissues of the uterus might cause in after years the production of a carcinoma of the body of the uterus. It is true that a few cases of carcinoma have been described as occurring after the use of radium, but there is no evidence to show that the radium application played any part in their causation. Leda J. Stacy has described three cases among 1013 cases treated at the Mayo Clinic by radium for benign conditions in the pelvis. In one case a patient, 55 years of age, who six and a half years previously had been operated upon for prolapse of the uterus, was treated in March, 1920, with a dose of 600 mg. hours of radium for hæmorrhage from the uterus. In January, 1921, she complained of an odourless bloody discharge, and received a further dose of 700 mg. hours and X ray treatment to the abdomen. In January, 1922, she had abdominal pain and discharge; hysterectomy revealed a carcinoma of the fundus uteri. In a second case a patient was given an intra-uterine application of radium of 500 mg. hours for fibromyomata of the uterus; this was followed by amenorrhœa for two years. At the end of two and a half years she developed a blood-stained discharge and abdominal pain, and the uterus when removed showed a carcinoma of the body.

Jacobs has described the case of a woman of 47 with small fibromyomata of the uterus, who was treated for profuse menorrhagia in October, 1919, with 148 mg., applied for 48 hours, above the pubes

and in the cervix, and this treatment appears to have been repeated every three weeks for four months. In June, 1920, she had had no periods for three months. In July she developed severe hæmorrhage and an offensive discharge, masses of growth came away through the cervix, and she died in September. In this case the patient would appear to have received the enormous dose of 33,600 mg. hours of radium; there is, however, no record of any intra-uterine exploration, and the tube was placed in the cervical canal, not in the uterus. The history suggests the development of a sarcoma rather than a carcinoma. If any large series of cases of menorrhagia are treated with radium, a proportion of them is certain to develop cancer of the body of the uterus, but it would require a very large number of observations to establish any definite relation between the use of radium and the development of malignant disease.

Series of Cases Treated Personally.

During the period July, 1916, to the end of June, 1922, I have had under my care 77 patients treated by the intra-uterine application of radium emanation or radium element. Of these nine unfortunately have been lost sight of. Of the remaining 68, 34 were treated for profuse hæmorrhage at the menopause, 23 for hæmorrhage associated with fibromyomata of the uterus, and 11 for menorrhagia unaccompanied by any general or pelvic disease. Of the 34 cases at the menopause the ages varied from 40 to 52 years. All of them were suffering from severe hæmorrhage calling for treatment, 10 of them had been curetted unsuccessfully on one or more occasions (one 18 times!), and one had had five X ray treatments with no result. The average dose of radium emanation employed in these cases was 2000–2400 millicurie hours, varying from 1200–3280 millicurie hours; the largest external dose employed was 1020 millicurie hours, and the largest dose given to any one patient was 2400 and 3280 millicurie hours in two doses at a considerable interval. Of radium element the average dose employed was 2000–2400 mg. hours, and the largest dose employed externally 400 mg. hours.

In 33 of the 34 cases complete amenorrhœa has resulted, in 15 immediately after the treatment, in 11 after the occurrence of one period, and in 7 after two or more periods. In one case, at the age of 46, four years after the treatment, the periods have been controlled and are normal in amount but have not yet ceased. In this case treatment was undertaken in the hope that amenorrhœa would result, and that very severe headaches from which the patient suffers at her periods might in this way be relieved, but this result unfortunately has not followed. It is quite likely, however, that a second application might have had the desired effect, the original dose having been the comparatively small one of 2620 millicurie hours.

In the 23 cases complicated by the presence of fibro-myomata in the uterus, the ages varied from 36–55 years. In all the periods were so profuse as to call for treatment. The average dose employed in this series was 2500–3000 millicurie hours, varying from 2000–4248 millicurie hours, the largest external dose used was 1100 millicurie hours, and the largest given to any one patient 2070 and 4248 millicurie hours in two doses; of radium element the average dose was 2400 mg. hours, and the largest external dose used 400 mg. hours. In 16 cases complete amenorrhœa has followed the treatment, in 10 without any further bleeding, in 3 after one period, and in 3 after two or more periods. In two cases a second application was necessary. The first, a patient, 52 years old, had suffered from menorrhagia for several years, and had a fibromyoma of the uterus reaching up to the umbilicus, the sound passing six inches. She was very stout, with a high blood pressure, and quite an unsuitable subject for an abdominal operation. An application of 2070 millicurie hours in 1916 resulted in amenorrhœa lasting seven months; the periods then returned and gradually increased in amount. Four years and a half later, as the periods still continued and were excessive, the patient consented to a second application, and on this occasion a dose of 4248 millicurie hours has resulted in complete amenorrhœa. The second dose should obviously have been given at a shorter interval after the first. In the second case, a patient, 46 years of age, with a uterus containing small fibromyomata, the sound passing 4¼ inches, a first dose of 2425 millicurie hours, followed at an interval of 18 months by a second one of 300 millicurie hours, has resulted in complete cessation of the periods. In this case a troublesome leucorrhœa persisted for some months after the first treatment. In five cases the treatment has been unsuccessful or only partially successful, the periods having returned after one application; these will require further treatment. Two of them have recently been given a second treatment, and the others have been recommended to have this done.

The ages of the 11 patients treated for hæmorrhage not due to any general or pelvic disease varied from 22–42 years. Two were under 30 years of age, eight between 30 and 40, and one 42 years of age. In six of these patients complete amenorrhœa has resulted after one or more periods, two have undergone hysterectomy, and in three the hæmorrhage has been controlled by the treatment. The average dose in these cases varied from 660 to 3186 millicurie hours, the average being 2000–2400 millicurie hours, the largest dose given at one time being 2700 millicurie hours inside the uterus and 1320 millicurie hours through the abdomen over the ovarian regions.

Of the three patients in whom the treatment has been successful in controlling the excessive losses at the periods, the first, a nullipara 22 years of age, had suffered from severe menorrhagia, and had been curetted without any result. She was profoundly anæmic and unable to follow her occupation. The first dose of 2900 millicurie hours was followed by marked diminution in the amount lost at the periods, which became irregular and scanty; this condition lasted for one year, and at the end of that time the periods returned and gradually became excessive again. The administration of a second dose of 2400 millicurie hours, 17 months after the first, has resulted in complete amenorrhœa after one period, and the patient is now, a year later, in very good health and able to work hard. The second case was that of a patient 28 years of age, who had been curetted and had had 15 applications of X rays for excessive periods with little benefit. The menorrhagia followed an attack of influenza shortly after the birth of the last child in January, 1919; an intra-uterine application of 3100 millicurie hours was given in January, 1920, and since then the periods have been irregular and scanty. In the third case, a patient 33 years of age, who had suffered from menorrhagia for some years and had been curetted with no benefit, two applications of 2400 millicurie hours, at an interval of 20 months, followed by an external application of 450 mg. hours 18 months later, have controlled the loss. The periods are now regular and normal in amount, provided that the patient rests at the time.

In two of these 11 cases hysterectomy has been performed; in one, a woman 37 years of age, after one application of 2380 millicurie hours, amenorrhœa resulted for four and a half months. The periods then returned, and the patient went to another hospital, where the uterus was removed. The second case was that of a woman of 40 with severe menorrhagia, in whom complete amenorrhœa for 12 months followed an application of 2400 millicurie hours; at the end of this time there were slight irregular losses with a complaint of pain down both legs, and nine months later the patient underwent subtotal hysterectomy at another hospital. The uterus when removed showed no signs of disease.

The amenorrhœa following the application of radium is no doubt due to its effect upon the ovaries and the destruction of the Graafian follicles which it bring about; it also produces some local destructive effect upon the mucosa of the uterus, but the not infrequent

return of the periods in young women shows that these effects may be merely temporary and may be entirely recovered from. No doubt the recurrence of the periods is associated with the maturation of fresh Graafian follicles in the ovaries. It has been suggested that the radium may produce a direct effect upon the tissues of a fibromyoma, but this is doubtful; the shrinkage of these tumours which undoubtedly follows is no doubt due to the onset of the menopause. A sufficient number of cases of pregnancy with the birth of healthy children have been recorded after the use of radium in young women, to show that when the periods return normal pregnancy may occur, and there is no evidence that the children of such pregnancies are more likely to be maldeveloped or deformed, although monstrosities can be produced if pregnant animals are exposed to the action of radium in the early weeks of pregnancy.

The results obtained by those who have employed radium in the treatment of hæmorrhage from the uterus show that it is a valuable and efficient method of controlling excessive hæmorrhage at the menopause; that it can be employed safely for the same purpose in small uncomplicated fibroid tumours of the uterus, and that by its means excessive menorrhagia in young women which resists ordinary methods of treatment can be brought under control.

For the radium used in the treatment of the patients under my care in University College Hospital I am indebted to the Medical Research Council, who have kindly lent the hospital authorities 500 mg. of the salt for purposes of research and treatment. The details of the cases treated in the hospital have been more fully set out in a report furnished to the Council.

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THE ANÆSTHETIC ACTION OF PURE ETHER.

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ETHER has been used since 1846 to produce surgical anæsthesia. Practically all the innumerable investigations of its action in this direction have proceeded upon the assumption that the essential anæsthetic properties were due to diethyl-ether itself, and that the impurities which commercial samples usually contain might complicate the effect by their irritant properties, but would make no significant contribution to the anæsthetic action. A very exhaustive review of the work on ether and its properties up to 1911 is given by Baskerville and Hamor,[1] and, if before that date suggestions that really pure ether was deficient in anæsthetic properties had been made, it is clear that they had not commanded serious attention. In all laboratory investigations of the mechanism of anæsthesia, in which parallels have been established between intensity of anæsthetic action and various physical properties—lipoid solubility, surface activity, &c.—ether has always formed an important member of the series of compounds examined; and the correspondence established between anæsthetic properties and such physical constants have had reference to those of diethyl-ether itself and not of any impurity contained in it. So that the proposition that perfectly pure ether was devoid of anæsthetic properties, if established, would involve not merely some practical change in the preparation of ether for anæsthetic purposes, but a wholesale revision of laboratory data on which the current theories of anæsthesia have been founded. It might entail the abandonment of all theories relating anæsthetic to physical properties, unless, indeed, it could be shown that the partition coefficient of ether between water and oily solvents, its action in lowering the surface-tension at a water-air surface, its aggregating effect on protein sols, and all its other known physical properties, were determined not by the properties of pure ether itself, but by the presence of traces of impurities.

One would expect that a proposition of such revolutionary importance would only be put forward with the support of abundant and exactly documented evidence. During the past six years it has been made from two different quarters. In 1917 J. H. Cotton[2] stated that he had been able, by carefully purifying ether, to deprive it of its anæsthetic properties. An animal subjected to the action of such purified ether was narcotised—i.e., apparently, rendered drowsy and quiescent—but remained hyperæsthetic, responding with abnormal vigour to stimuli. Cotton attributed the anæsthetic property of ordinary ether to the presence of small quantities of dissolved gases, ethylene and carbon dioxide being those identified. The addition of either of these gases to pure ether was stated by Cotton to confer upon it remarkable anæsthetic properties, so that an animal so little narcotised as to be able to walk about the room was rendered completely analgesic, while a human patient could be deprived of all sensation of pain by its administration in quantities not sufficient to cloud the consciousness or affect the power of speech. Following these indications, an American firm introduced a preparation consisting of purified ether, in which ethylene and carbon dioxide were dissolved in the proportions of 2 per cent. and 0·5 per cent. respectively. The question whether ethylene by itself has any anæsthetic action is at least in doubt. There are early records of its trial, as by Nunneley,[3] of Leeds, about 1849; but there is certainly nothing in such records to suggest such potency for ethylene that the addition of 2 per cent. of it to ether could have the alleged effect. In recent years Lumbard,[4] a user of Cotton's ether, states definitely that ethylene alone acts simply as an asphyxiant, like nitrogen. Carbon dioxide is normally present in the air of the lungs in the proportion of about 5 per cent. No immediate explanation is therefore available for the suggested action of these gases in imparting to ether its anæsthetic properties. In default of such, and in view of the somewhat meagre nature of the direct evidence provided by Cotton in support of his statements, it is not surprising that his conclusions were not generally accepted.

In June, 1921, a paper was published by Wallis and Hewer[5] on a New General Anæsthetic. In the first section of the paper, for which Dr. Mackenzie Wallis is responsible, the statement that perfectly pure ether has no anæsthetic properties is implied, though it is not made in exactly that form. It is stated, for example, that "pure ether . . . when freshly prepared can be given in large quantities to animals without producing anæsthesia," and, again, that "the purer the sample, the more of it is required to produce anæsthesia." Later in the paper, although the possession of some anæsthetic properties by pure ether is not specifically denied, reference is made to its use as "a vehicle for the anæsthetic compound," and it is stated that "certain ketones in the ether were largely responsible for the anæsthetic properties of the ether," and that pure ether was used as a "volatile solvent" for the "mixture of ketones." The impression is therefore given that if ether itself has any anæsthetic properties at all, it has them in a subsidiary and even insignificant degree, so that its real function in the preparation of a good "anæsthetic ether" is to serve as a volatile vehicle for the truly

and potently anæsthetising "ketones." On some other points it is difficult to be certain of Dr. Wallis's meaning. Apparently his method was to take crude ether, distil it from finely-powdered permanganate to remove irritating impurities, and then dry it by shaking with anhydrous copper sulphate. After such treatment the ether contained a less volatile, pleasantly smelling residue, which "proved to contain ketones." These, being identified as the "essential element," can be artificially added to strengthen the anæsthetic properties. The significance of the gases of Cotton's ether, which Wallis also added, was, apparently, only to intensify the anæsthetic action of the mixed ketones, with which they are held to form "a loose chemical combination."

The practical outcome is the recommendation, as a general anæsthetic, of a mixture prepared by taking ether, purified by treatment with permanganate and copper sulphate, and adding to it, in unspecified amount, a mixture of ketones (identified only as comprising those in the middle of the series) which has previously been treated with carbon dioxide and ethylene. Dr. Wallis states that "the preparation of this anæsthetic, according to the method described above, has been undertaken by Messrs. Savory and Moore, who have now placed it on the market under the name 'Ethanesal.'"

Our own investigations have been directed to two points.

1. We desired to settle, to our own satisfaction, the questions of great theoretical as well as practical importance, raised by the statement that pure ether has little or no anæsthetic action.

2. We have examined the preparation known as "ethanesal."

The chemical work has been carried out by H. King, the animal experiments by H. H. Dale, with valuable cöoperation from Dr. J. H. Burn, and the trials on human patients by C. F. Hadfield.

I. *The Action of Perfectly Pure Ether.*

(*a*) *Preparation.*

The preparation of absolute diethyl oxide was carried out by one of us (H. K.) as follows. The starting material was absolute ethyl alcohol, which was fractionated through a 12-bulb, pear-form still-head, the fraction boiling at 78° C. being collected. This was converted into ether by the sulphuric acid process and fractionated through the same column to free from the main bulk of unchanged alcohol. The ether was washed with 3 N−caustic soda, and with successive portions of water. One litre of such ether was boiled gently under reflux with 25 gr. of finely-powdered potassium permanganate for eight hours. The presence of the water in the wet ether facilitates the interchange of oxidisable material, as potassium permanganate is insoluble in dry ether. On the following day 25 g. of powdered caustic potash were added to the mixture, and the boiling continued for eight hours. The wet ether distilled through a 12-bulb pear-form column between 34·2° and 34·7° at 751 mm. It was dried over best quality calcium chloride and then allowed to boil gently for eight hours over metallic sodium, and then distilled through the usual column. Apart from the first running the whole distilled between 34·1° and 34·15° at 751 mm. This is in perfect agreement with Wade and Finnemore's[6] boiling-point (34·5° at 760 mm.), as a rise of pressure of 1 mm. causes an increase of boiling-point of about 0·04°, so that at 760 mm. our ether would boil between 34·46° and 34·51°.

We believe the ether so prepared to have been as pure as can be obtained. Bourne and Stehle[7] have recently described the preparation of ether from ethyl iodide and sodium ethoxide. They regard this method as excluding the subsidiary substances to which the anæsthetic properties have been attributed, and find that the ether so prepared is fully active. We regard the procedures to which our own preparation was subjected as excluding even more completely all possible impurities. It was perfectly free from aldehydes, ketones, acids, mercaptans, alcohol, and all other known impurities, including ethylene, which is immediately destroyed by alkaline permanganate.

(*b*) *Tests on Animals.*

This pure, dry ether was first carefully tested in the laboratory on a series of cats by one of us (H. H. D.). The animal was, in each case, gently secured on a table and the ether administered by the open method on a gauze mask, made to fit over the snout. Induction occurred perfectly smoothly and with a rapidity at least equal to that normally seen in this species with ordinary, good anæsthetic ether so administered. Such difference as was observable was entirely attributable to the smaller amount of pharyngeal and tracheal secretion provoked, the pure ether being distinctly less irritant than most specimens of ether sold for anæsthetic purposes. This absence of irritation not only facilitated induction, but enabled deep anæsthesia to be maintained with a smaller quantity of the ether. In one experiment, in which volumes were carefully recorded, a comparison was made between the respective quantities, of the pure ether and of a not very satisfactory commercial sample, required to keep a cat of 3 kg. for one and three-quarter hours under anæsthesia, of such depth that the corneal reflex was just abolished. The volumes were: Pure ether, 65 c.cm.; commercial ether, 100 c.cm. No accuracy is claimed for these figures, the method of administration being the open method, with a gauze mask; but they give some measure of our dissent from the statement that "the purer the sample the more of it is required to produce anæsthesia." Our experience has been the direct opposite of this; the purer the ether, the more easily and smoothly has anæsthesia been induced and maintained in experiments on animals. In some of our experiments with perfectly pure ether, after the cat had been kept deeply anæsthetised for periods up to two hours, the administration was stopped, when the animal recovered consciousness at a normal rate. In later experiments with the same pure ether the arterial blood pressure was recorded after anæsthesia had become complete, and the fullness of the anæsthesia was demonstrated by applying strong electrical stimuli to exposed sensory nerves. The only effect was a small rise of arterial blood pressure, without any trace of movement of voluntary muscles; this having been demonstrated, the animal was killed. In one pair of such experiments, two cats of equal weight and of about the same age and build were taken. One was anæsthetised with the pure ether, and the depth of the anæsthesia confirmed as above. The pure ether used in this case was not made by us from alcohol, but was separated from "ethanesal" and subjected to the rigid purification process described above. The other was anæsthetised on the following day and for the same period with "ethanesal," as bought from the manufacturers, the same tests being applied. The efficiency of "ethanesal" as an anæsthetic was neither better nor perceptibly worse than that of the pure ether. To maintain for the same period the same depth of anæsthesia slightly more of the "ethanesal" was, as a matter of fact, used; but the method was not an exact one, and we attach no importance to the difference observed, except as an indication that the pure ether was not the less efficient of the two.

(*c*) *Effects on Human Patients.*

The good and safe action of our preparation of pure ether as an anæsthetic for animals having been placed beyond doubt, we considered it desirable to confirm its efficiency by using it for patients requiring anæsthesia with ether for surgical operations. The member of our team (C. F. H.) who undertook to administer it in this way was familiar with the effects of various makes of anæsthetic ether, including "ethanesal." The results, like those obtained in experiments on cats, were decisive in favour of the

efficiency of perfectly pure ether as an anæsthetic. The number of cases in which pure ether was used to anæsthetise human patients was limited to eight, this being regarded as sufficient to establish or disprove its power to produce surgical anæsthesia. To determine satisfactorily its superiority to other anæsthetic ethers would require a long series of cases, and for this purpose sufficient material was not prepared, it being foreign to the primary object of the investigation.

In most cases a preliminary hypodermic injection of atropine (usually 1/100 gr.) was given, and in one or two this was combined with morphia (⅛ gr.). With this exception no other drug of any kind was used except pure ether. In all cases anæsthesia was induced with a Clover's ether inhaler of the usual type, and in most this was used throughout. Care was taken to avoid any cyanosis, so that the favourable results obtained could not be attributed to the presence of an excess of carbon dioxide. In two instances (Cases 1 and 5) the Clover's inhaler was discarded after induction and an open method substituted. This was not done in all cases in order to economise the pure ether. These open cases were as satisfactory as the closed. The patients selected were those with whom the administrator did not consider it probable that he would encounter any difficulty in maintaining an anæsthesia suitable for the operation with ordinary ether without the assistance of other agents. It will be understood that these observations could only be regarded as secondary to the surgical requirements. This will explain the fact that all the patients happened to be women; the exclusion of men was quite unintentional.

The cases are enumerated in the following table, which includes the age of the patient, the nature of the operation, and the duration of the administration, from the commencement of induction to the end of the operation.

Case.	Age.	Nature of operation.	Duration of operation in mins.
1	60	Colpoperineorraphy.	53
2	19	Dilatation and curetting for dysmenorrhœa.	48
3	50	Drainage of septic finger.	15
4	28	Vaginal Cæsarean section.	45
5	32	Tubercular peritonitis diagnosed as appendicitis. Both tubes were removed through the appendix incision.	50
6	45	Exploration of necrosed phalanges.	17
7	59	Cystoscopy and lumbar nephrectomy.	60
8	33	Dilatation and curetting.	30

A comparison of the rapidity of the onset of anæsthesia in these cases with results obtained using the same method with ordinary ether is difficult to one unaccustomed to make frequent use of this precise routine. The impression left on the mind was that the smoothness and speed of thus reaching surgical anæsthesia were such that, if they were equally obtainable with commercial anæsthetic ether, the advantage of a preliminary exhibition of nitrous oxide or ethyl chloride would be scarcely appreciable.

It is quite unnecessary to describe the cases in detail, but Case 7, as being by no means the most easy subject, may be taken as typical. She was a stout and emphysematous woman of 59 years. Pure ether having been placed in the reservoir of the Clover, the face-piece was applied, and, after a few breaths of air had been allowed, the ether was gradually turned on. There was no struggling or coughing, and very little salivation. The reservoir was rotated as far as 2—i.e., half-way to full—and in five minutes from the commencement the patient had been lifted on to the operating table and the parts were being cleansed preparatory to a cystoscopy. The examination proving satisfactory, she was placed in the lateral position, with a raised bridge under the loin, and lumbar nephrectomy was performed. During the operation the Clover was kept at 1 or 1¼. Owing to the emphysema and the position of the patient much air had to be allowed to avoid cyanosis. At the close of the operation it was found that, in all, 4¾ fluid ounces of pure ether had been used. The surgeon, unaware of what anæsthetic was being administered, expressed himself as entirely satisfied with the anæsthesia.

Particulars of the other cases would be little more than repetitions of the above, except in the two cases where the open method gave equally good results. As far as could be judged from so small a series, the recovery and after-effects were certainly no worse than those usually following anæsthetic ether. During the induction the tendency to coughing and salivation certainly appeared to be less than usual. In all cases the surgical anæsthesia was complete, and no complaint was made of rigidity. The only abdominal case was particularly well relaxed, as may be judged from the nature of the operation. One surgeon was so impressed by the rapidity of the induction that he thought that ethyl chloride had been administered.

These cases appear to prove beyond doubt that chemically pure ether is an anæsthetic, at least as satisfactory and effective for the human subject as the best ethers usually sold for that purpose.

We cannot offer any satisfactory explanation for the complete discrepancy between these observations and the statement, definitely made by Cotton, and clearly implied by Wallis's account of his work, that pure ether has, of itself, no anæsthetic properties at all. The process to which our ether was subjected would certainly remove, not only impurities, such as mercaptan and aldehyde, but any traces which might be present of ethylene and ketones, to which the anæsthetic properties of ether have been attributed. Its anæsthetic properties were thereby certainly not impaired. On the other hand, we have the statement, from two different sources, that a purified ether was found to have no true anæsthetic action. The observer in one case (Dr. Hewer) is personally known to one of us as a colleague whose competence and experience in this field are beyond question. It is impossible to suppose that the pure ether which he tested, with a pint of which he was unable to anæsthetise a child of seven, can have had properties similar to those of the pure ether used in our experiments. The recorded data as to the methods of preparation and the other properties of these non-anæsthetic ethers are rather scanty, and those which are given—e.g., the range of boiling-points mentioned by Wallis—are such as to indicate that our ether, in so far as it differed from them at all, differed in being purified more rigidly, and not in containing active impurities. The presence of ketones would cause the boiling-point to rise towards the end of the distillation; that of Wallis's preparation appears to have risen slightly, while ours remained constant to 0·05°C. We must leave the discrepancy, without even a suggestion as to its meaning, and be content to record our conclusion that the failures to obtain anæsthesia with purified ethers have not been due to their purity.

This demonstration of the satisfactory anæsthetic properties of pure ether has seemed to us important, not merely as clearing away difficulties and anomalies from the theory of the subject, but as indicating the true aim of a practical policy. In our opinion efforts to improve the properties of ether, as an anæsthetic for ordinary use, can be most profitably directed to the discovery of methods for rendering and keeping it free from the irritant impurities, which are produced in its preparation, and which, in some cases, are liable to be formed when it is kept in contact with air and exposed to light. It may be doubted whether the tests for purity laid down by the British Pharmacopœia are sufficiently stringent. On this point we are glad to find ourselves in agreement with Wallis and Hewer. There is a large body of information concerning the impurities likely to occur and the tests for their presence. This has been admirably summarised in the paper, above mentioned, by Baskerville and Hamor.[1]

II. "*Ethanesal.*"

As stated above, our experiments with "ethanesal," as now supplied commercially, failed to afford us any evidence of an anæsthetic potency which is not satisfactorily accounted for by that of the purified ether, which is its main constituent. We desired, nevertheless, to observe for ourselves the action of the very potently anæsthetic ketones, which, according to Wallis's statement, it should contain. Several samples of "ethanesal" were accordingly purchased and submitted to fractionation. These investigations failed to reveal the presence of any ketones; the only constituent, apart from ether, present in significant amount was, in the case of all samples examined, normal butyl alcohol.

Chemical Examination of "Ethanesal."

An analytical record of "ethanesal" is given in THE LANCET (1921, vol. i., p. 1309), which shows that 98 per cent. distils below 40·2°, and 2 per cent. above 40·2°, and that it contains a very small amount of a substance oxidised to aldehyde by chromic acid, which presumably is ethyl alcohol.

The samples of "ethanesal" examined by us, and bought at different times on the open market, differ considerably from the above. Three pounds (1360 g.) of "ethanesal" were distilled through a 12-bulb pear-form still-head, when 95·5 per cent. distilled between 33·6° and 34·2° at 755 mm., and consisted of good quality dry ether. The remaining 4·5 per cent. was fractionated through a 17-inch rod-and-disc column, when the following fractions were obtained:—

Up to 110°.	110–117°.	Residue.
5·5 g.	48·8 g.	6·5 g.

The large middle fraction was refractionated and gave the following fractions:—

Up to 116·5°.	116·5–117·5°.	Residue.
8·1 g.	36·6 g.	3·0 g.

On refractionation of the first and last of these fractions, with the first and last of the previous fractionation, the following small fractions were collected:—

(1)	(2)	(3)	(4)	(5)
50–80°.	80–90°.	90–100°.	100–110°.	117°.
0·2 g.	1·9 g.	2·05 g.	0·95 g.	16·8 g.

In this way there were obtained 53·4 g. of pure *n*–butyl alcohol boiling at 117°. It was identified by its odour, its boiling point, by conversion into *n*–butylbenzoate (b.p. 247°–248°), by conversion into *n*–butylacetate, and by its solubility, 1 in 10, in water.

Fractions (1) to (4) were then examined. Fraction (1) 0·2 g. contained some ether which passed off on gently warming, leaving a liquid with the odour of pure ethyl alcohol, and giving crystalline iodoform by the test; there was no odour of acetone. Fractions (2), (3), and (4) all had the odour of *n*–butyl alcohol through insufficient fractionation, (3) and (4), for the same reason, being only partially miscible with water.

The first three fractions also reduced ammoniacal silver nitrate in the cold, (1) and (3) to a slight extent, but (2) very strongly, with production of a silver mirror. This pointed to the presence of an aldehyde, and this was confirmed by the observation that (2), but not (1) and (3), restored the colour instantly to Schiff's reagent. Ketones, if present in any of these fractions, are so in very small proportions, as there was no acetone odour of the simplest ketones, or camphoraceous or peppermint odour of the higher ketones.

To summarise, the samples of "ethanesal" examined contained 95·5 per cent. ether, 4 per cent. of *n*–butyl alcohol, and 0·5 per cent. of a mixture of ethyl alcohol and an aldehyde, and possibly other substances in traces. An examination of what were apparently batch numbers on the bottles showed that the three bottles of "ethanesal" used in the above examination belonged to two different, not consecutive batches. We have since obtained two bottles bearing an earlier batch number than either of these, and an examination gave practically the same result; the added material consisted mainly of *normal* butyl alcohol, boiling at 117° C.

We communicated the substance of the above observations to Messrs. Savory and Moore, who informed us that normal butyl alcohol should not be a constituent of "ethanesal," and that its presence in the samples we had examined must have been due to an error. The question is not one which we can explore further, without knowledge of the composition which "ethanesal" is supposed to have, if correctly prepared, and of the method of its preparation. This information is not at our disposal. It is, of course, well known that *iso*–butyl alcohol can be converted by oxidation to methyl-ethyl-ketone, while similar treatment, applied to *normal* butyl alcohol, would not produce a ketone, but might easily lead to conversion of some of the normal butyl alcohol to butylic aldehyde. If *iso*-butyl alcohol were the normal starting-point, for the production of the "ketones" added to ether to make "ethanesal," obviously the substitution, by error, of *normal* butyl alcohol might lead to a product such as we have examined. Our finding of normal butyl alcohol, with some aldehyde, as the essential accessory constituents in "ethanesal," would then have to be attributed to our curious misfortune in obtaining for examination only such batches as had suffered from this error of preparation. There is, however, a further difficulty in the way of such a supposition. A "fruity" odour is recognised by anæsthetists, and claimed by the manufacturers as a characteristic of "ethanesal." The odour of *normal* butyl alcohol could be so described, and that of the aldehyde is even more distinctly of this type. A mixture of these two has been recognised, by an habitual user of "ethanesal," as having the characteristic "fruity" odour. On the other hand, neither methyl-ethyl-ketone, nor any other ketone with which we are familiar, has an odour resembling this, or obviously suggesting "fruitiness." In default of more precise information we are left in a state of complete uncertainty as to whether any of the numerous published clinical observations of the action of "ethanesal" were carried out with ether containing genuine ketones, or with ether containing *n*-butyl alcohol, of which some portion had been oxidised to butylic aldehyde. Meanwhile, in view of our own failure to detect any real difference between the action of "ethanesal" and that of pure ether separated from it, or independently prepared, we feel justified in waiting for further proof before concluding that the nature of the added constituent would make any serious difference, except to the flavour.

Conclusions.

1. Our own observations give no support to the statements that pure ether is devoid of anæsthetic action, and that the activity in this direction of ordinary ether is due to impurities. On the contrary, so far as the anæsthetic action of ether is affected by purification, it is in our experience improved by the removal of impurities, which irritate the respiratory mucosa and cause excessive secretion, but otherwise unchanged. The purest ether is the best, as an anæsthetic.

2. Samples of "ethanesal," as purchased from the makers, have been found to consist essentially of ether with about 4 per cent. of normal butyl alcohol and a small quantity of an aldehyde. Our observations afford no evidence to warrant the attribution of its anæsthetic properties to any other constituent than the ether. We find no reason for supposing that the presence of the added substances materially affects any property of the ether vapour, except the flavour.

References.—1. Baskerville and Hamor: Jour. Ind. and Eng. Chem., 1911, p. 301. 2. Cotton: Jour. Canad. Med. Assoc., September, 1917. 3. Nunneley: Trans. Provincial Med. and Surg. Assoc., 1849, vol. xvi., p. 167; also B.M.J., 1868, i., p. 593. 4. Lumbard: Am. Jour. of Surg. (Anæsthetic Supplement), 1920, vol. xxxiv., p. 118. 5. Wallis and Hewer: THE LANCET, 1921, i., p. 1173. 6. Wade and Finnemore: Jour. Chem. Soc., 1909, p. 1854. 7. Bourne and Stehle: Jour. Am. Med. Assoc., 1922, vol. lxxix., p. 375.

Comments by Dr. R. L. MACKENZIE WALLIS.

The observations made by Dale and his co-workers, and recorded above, call for comment on two main points, viz. (1) the vexed question as to whether chemically pure ether is a potent anæsthetic agent, and (2) the value of added chemical compounds, particularly ketones, as anæsthetic agents. With regard to (1) our work was commenced with this problem uppermost in our minds, since all the work has been concentrated upon the purification of ether. This was emphasised in the paper we published in THE LANCET, 1921, i., 1173. The pure ether was prepared in a similar manner to that described above, but differed slightly in the final stages of purification. After being treated with permanganate, copper sulphate, and sodium, and redistilled after each stage, the ether was allowed to stand in contact with sodium for several weeks. On being again distilled an ether of remarkable purity was obtained possessing a very slight odour, and when given as an anæsthetic proved to be so weak as to be useless. This pure ether was very unstable, and had to be kept in black bottles, and great care taken to avoid shaking. Further, it was always used fresh when trying its effects as an anæsthetic.

The work of Cotton was published at this time, and we were interested in his conclusions, and made attempts to confirm them. The only point on which we found that we were in agreement was on the question of the weak anæsthetic action of pure ether. Finding that the chemically pure ether was a weak anæsthetic, and this conclusion was reached only after much deliberation, and control observations which gave no conceivable outlet for fallacy, our attention was drawn naturally to the factor or factors concerned. In this way the presence of ketones was detected, and the chief ketone appeared to be methyl-ethyl ketone. On adding this in increasing quantities to pure ether the anæsthetic properties were increased and in proportion to the amount added.

Now we have always found that our "detoxicated" ether possessed quite a good anæsthetic action—viz., the ether prepared from trade ether by means of permanganate and anhydrous copper sulphate. This ether, however, was found to vary in its action according to the source of supply of the trade ether. The procedure as finally evolved consisting in making detoxicated ether from one constant supply of ether, each batch being made in exactly the same way. To this detoxicated ether ethyl-methyl ketone was added in the strength of 2 per cent. As so many complaints were made that this mixture was too weak, and even weaker than ordinary anæsthetic ether, the strength of the added ketone was increased to 5 per cent. Since this increase no complaints were received. At the present time we are quite at a loss to explain why the product "ethanesal" was found by Dr. King not to contain ketones, particularly as we are unaware that any departure from the original process had been made.

All recent work has been concentrated upon the anæsthetic action of ketones. A number of ketones do undoubtedly possess anæsthetic or hypnotic action, and some that we have made have proved to be quite potent in this respect. All the observations tended to show that our ether-ketone mixture was a good and reliable anæsthetic, and differed in many respects from ordinary anæsthetic ether. Many of our observations have been confirmed by others, and this alone has stimulated us to pursue the matter further.

We admit that certain forms of pure ether have an anæsthetic action, that our detoxicated ether always has, but that the ether-ketone mixture is better than either, and, furthermore, has a totally different action to either of the other two forms of ether. We are quite at a loss to explain the above observations of Dale and his co-workers, and can only conclude that they have made a very good sample of detoxicated ether.

I am very grateful to Dr. Dale for permitting me to see a copy of the above paper, and for an opportunity of explaining the results obtained by Hewer and myself.

Comments by Dr. C. LANGTON HEWER.

Dr. Dale has been kind enough to let me see a copy of the above paper, and I should like to make the following comments thereon.

In the first place, I should like to make it clear that I am speaking purely as an anæsthetist, as I am not competent to discuss the somewhat intricate organic chemistry involved, and this side of the question has been dealt with by Dr. Mackenzie Wallis.

The first consideration is the *anæsthetic action of pure di-ethyl ether.* The original ether prepared by Dr. Wallis's method was found to produce no appreciable anæsthetic action on animals, and was given to me for trial on human beings. The first cases to which I administered this ether were children. The method used was an open mask with about 20 layers of gauze, and I found that the patients passed into the second or excitement stage of anæsthesia, but it was impossible to produce narcosis within a reasonable time (20 minutes). Nearly one pint of the ether was used in each case. An adult patient (a girl of 19) was next tried, using the ether in a Clover's inhaler. By keeping the indicator at "full" for six minutes (having previously taken about five minutes to rotate it from "0"), a light degree of anæsthesia was obtained, but on adopting the open method it was impossible to keep the patient sufficiently still for the operation to proceed, and a change over to ordinary "anæsthetic ether" was made, after which no further trouble was experienced.

The remainder of the pure ether was then given to another anæsthetist (Dr. B. B. Sharp, late resident anæsthetist to St. Bartholomew's Hospital), who employed it on a child of 7. In 15 minutes the child was still struggling violently, and a C.E. mixture was given, with immediate narcotic effect. Dr. Sharp at that time knew nothing of the theories concerning pure ether, and remarked to me that "this ether is no good as an anæsthetic." Since it was obviously impossible to continue indefinitely using this ether, I deemed that sufficient evidence had been obtained that it had no appreciable anæsthetic properties.

Turning next to the evidence of other observers, Dr. Dale has already referred to Dr. Cotton's statement that pure ether is not an anæsthetic, and we need not discuss that further.

In a recent American paper, however (*American Journal of Surgery*, vol. xxxvi., No. 7), Dr. Paul Cassidy makes two observations on Cotton Process ether: (1) That using the open method it was an indifferent anæsthetic; and (2) that if the cans were opened within a special inhaler devised by himself a much stronger anæsthetic action occurred. He then analysed the ether and found that—

5 mins.	after opening the can it contained	2·24 %	ethylene at 79·7° F.
10 ,,		1·87 %	
40 ,,		0·26 %	

Now since Cotton Process ether contains ethylene, carbon dioxide, pure ether, and a trace of alcohol only, the only variable factor was the gaseous constituents (carbon dioxide and ethylene), and Cassidy therefore showed that when these had been lost the residue (pure ether) was a weaker anæsthetic.

In the same number of the *American Journal of Surgery* there also appeared an article by Dr. Webster entitled "Some New Anæsthetic Ethers," in which he describes his experiences with Cotton Process ether given by the open method—i.e., pure ether with little or no ethylene. He says: "By this method I found to my great disappointment that the induction period was on the average longer than with other ethers. Often 16 to 18 minutes after commencing induction the patient only reached the second

stage of anæsthesia. The excitement stage was considerably prolonged, and the quantity of anæsthetic was greater than with the make in ordinary use in this institution."

We thus see that at least five independent observers have found that pure ether has at any rate a considerably weaker anæsthetic action than has ordinary ether. In this connexion I should like to point out that when "ethanesal" was first prepared it contained only 1 per cent. ketones, but the manufacturers received so many letters from anæsthetists saying that the anæsthetic was much weaker than ether that the percentage of ketones was gradually raised to 5. Further, the purified ether used as the basis of "ethanesal" does have some anæsthetic properties, since it has only been "detoxicated"—i.e., mercaptans, &c., removed. It is unnecessary and indeed commercially impossible to purify the ether to the extent employed in the preliminary experiments, and consequently some of the original ketones remain in it.

Dr. Dale has kindly provided me with a small amount of the ether which Dr. King prepared, and I have used it on one case (a woman of 24). The induction period was 5½ minutes, using a Clover's inhaler, and the anæsthesia obtained was satisfactory. I used more anæsthetic than I should have expected with "ethanesal," but about the same as with ordinary ether. I should like to point out, however, that this sample of ether had a much more pungent odour than the original specimen prepared by Dr. Wallis. I am quite prepared to admit, on the other hand, that the ether prepared by Dr. King is an anæsthetic, thus agreeing with the results obtained by Dr. Hadfield.

The next point concerns *mercaptans*, and since Dr. Dale agrees with our findings that they are extremely toxic and should be removed from anæsthetic ether, I will not discuss the matter further.

Thirdly, there arises the question of the *anæsthetic action of ketones*. Dr. Wallis has shown that animals can be anæsthetised with a mixture of methyl-ethyl and vinyl-ethyl ketones provided that the temperature was high enough for adequate vaporisation. I have tried this mixture on children, and although the apparatus was crude (a drip-feed to an aluminium plate heated by a resistance coil fixed into the top of a mask), yet it at least demonstrated the anæsthetic action of these ketones. The practical difficulties of evolving a suitable vaporiser are great, and we have not yet been able to obtain a satisfactory apparatus. I might also mention that methyl-phenyl ketone (hypnone) has been used as a hypnotic for many years, and such substances as camphor and menthol have also been used as local analgesics.

Fourthly, we pass to the *anæsthetic action of ethylene and carbon dioxide*. We found that pure ether + carbon dioxide had no more anæsthetic action than the ether alone, unless one employs the gas in the patient's expired air as in a closed apparatus. The ethylene question has been partially discussed before, but I might add that we found that pure ether + ethylene gave a good anæsthetic if used before the gas passed out of solution. As Dr. Wallis showed in his original paper, this action was probably due to the ketones contained in the ethylene, and latterly it has been found unnecessary to add any ethylene to "ethanesal."

In conclusion, I would like to state that I have no doubt of the accuracy of the work of Dale and his colleagues, and I have recorded the above observations from the anæsthetist's standpoint only. I make no attempt to explain the apparent discrepancies in the results, and there is no doubt that the whole subject calls for a considerable amount of further work. At the same time, however, I should like to say that I have now used "ethanesal" in over 4000 cases, and am convinced that whatever may be its exact chemical composition, it gives, on the average, better results than any anæsthetic ether that I have tried.

CHRONIC SEPTIC SPLENOMEGALY.

BY GORDON WARD, M.D. LOND.

I VENTURE to set forth the following views with regard to a certain class of chronic splenomegalies because they have been of material assistance to me in both diagnosis and treatment. Although many physicians are well acquainted with a syndrome to which may be given the name "chronic septic splenomegaly," I am not aware of any detailed consideration of the subject from a clinico-pathological point of view. Considerations of space oblige me to treat the subject in didactic form, but I must point out that in arriving at the views here put forward I owe a great deal to many other authors in England, on the Continent, in America, and particularly in tropical countries. A large number of cases reported as Egyptian splenomegaly, and under various other names, appear to me to be examples of chronic septic splenomegaly differing in the variability of the ætiological factor but not in the essentials of the resulting pathological process.

Symptoms.

Chronic septic splenomegaly is a constant syndrome arising in many different circumstances and owning a variety of ætiological factors. A typical case should show the following characteristics: (1) a chronic septic focus, localised perhaps about the teeth, or on the heart valves or in the bowel (and then very difficult to identify); (2) a massive splenomegaly, considerable in degree, hard, and somewhat tender on palpation; (3) in the early stages, leucocytosis and slight or no anæmia, but later increasing anæmia with less leucocytosis or actual leucopenia; (4) in favourable cases complete recovery following the eradication of sepsis. These are the cardinal features commonly encountered and easy of recognition. Amongst other less constant features are: (5) fever; (6) hæmorrhages, epistaxis commonly, purpura not very rarely, but hæmatemesis scarcely ever; (7) enlargement of liver, of lymph glands, and of lymphadenoid tissues generally; (8) cirrhosis of those tissues from fibrosis of the affected areas.

The generalised reaction of lymphadenoid tissues constitutes the whole anatomical basis of the syndrome, but usually it is the splenomegaly which attracts attention and in many cases any marked enlargement of glands or liver may be looked for in vain. All of which, it may be noted, is also true of another generalised lymphadenoid reaction—namely, spleno-medullary leukæmia.

Ætiology.

In all cases septic organisms (as opposed to those which produce a specific histological picture—e.g., *B. tuberculosis*) seem to be the causal factors. This is proven in some cases by the prompt recovery when sepsis is removed[1] or following the use of vaccines when splenectomy had failed to cause improvement,[2] and is further suggested by the success of Lemaire[3] and Kristjanson[4] in transmitting the disease to dogs. Many cases have been ordinarily recognised as depending on sepsis—e.g., those described as endocarditis with splenomegaly[5] or as oral sepsis with splenomegaly.[6]

Pathology and Histology.

It appears that at first the septic organisms produce such results as we associate with their presence in any case—e.g., fever, pain, and leucocytosis. Later a more distinctly selective action on the lymphadenoid and connective (which are potentially lymphadenoid) tissues appears. There is then enlargement of the spleen and perhaps also of liver and glands. The blood now begins to deteriorate, and this is presumptive evidence of a like effect on the marrow. At first all such enlargements are somewhat acute and tender and the histology is that of a typhoid spleen, and were the sepsis as quickly terminated as in that disease it would as quickly return to normal. There follows a

stage in which the spleen is very large and indurated and the marrow is still further affected, so that the polymorph reaction fails and we find leucopenia. There is, however, often some red-cell attempt at reaction as shown by the presence of nucleated red cells. Later there may be hæmorrhages and death, or the condition may become so attenuated that there is time for contraction and fibrosis of the reacting tissues, manifested by cirrhosis of the liver and spleen.

The histology is that of chronic inflammation wherever encountered—i.e., it is a fibroblastic and/or plasma-cell reaction with no specific features. There is no excess of pigment in any of the tissues.

Diagnosis.

Diagnosis is by elimination. Various considerations will probably suffice to eliminate leukæmia, acholuric jaundice, malaria, kala-azar, Gaucher's disease, erythræmia, Hodgkin's disease, von Jaksch's syndrome, syphilis, tuberculosis, cancer with bone metastases, and such rarities as histoplasmosis, toxoplasmosis, and Krempf's splenomegaly. Where doubt remains, as may often be the case, the presence of a discoverable septic focus and tenderness of the spleen assume considerable importance, especially if the blood picture shows the early stage. Primary tuberculosis of the spleen is especially difficult to differentiate, but there the symptoms are usually more severe and the spleen very tender. In the blood signs of two processes are seen: first, a polymorph leucocytosis without eosinophilia gives place to a leucopenia in which the eosinophils may more than hold their own (a low-grade eosinophilia is common in many kinds of splenomegaly); and secondly, a more or less normal red-cell count with a low index is replaced by definite anæmia with a rising index.

Treatment.

This means eradication of sepsis. I have no short cut to intestinal sepsis to recommend, although I feel with Hollins[7] that this is what is most required. However, I have seen excellent results when dysentery was properly treated and when oral sepsis was eradicated.[8]

Relationship to Banti's Disease and Idiopathic Splenic Anæmia.

I believe that the conception of chronic septic splenomegaly set out above solves the ætiological problem in a great majority of the cases hitherto reported as splenic anæmia or as Banti's disease. There is reason to suppose that the sepsis in these cases is mostly intestinal, and therefore easily overlooked and not productive of any marked fever, &c. No doubt there remains a residuum of cases which must still be called idiopathic splenic anæmia and which await further investigation.

Groups of Cases Described under Different Titles.

1. *Splenomegaly with Endocarditis.*—This was well described by West[9] so long as 25 years ago and of late years has had increasing attention. Besides the papers of Libman[5] one may note the fully described case of Parkes Weber[10] and the case of Riesman[11] in which the spleen was removed. The splenic condition in an acute endocarditis is that of enteric and a variety of other conditions, but when the process becomes one of chronic continuing infection the syndrome of chronic septic splenomegaly appears and it is in this condition that one finds all stages of the syndrome. It is, however, complicated by signs of heart failure which obscure the clinical picture.

2. *Egyptian Splenomegaly.*—This type appears to depend on intestinal sepsis, the site of infection being provided by dysenteric ulcers or determined by the presence of helminth parasites. It has been reported from many parts of the world—e.g., by Archibald,[2] Day and Ferguson,[12] Footner and Archibald,[13] for the Sudan and North Africa, Duncan Whyte[14] and Maxwell[15] for China, Wooley[16] for the Philippines, and Sprawson and Mackie[17] for Mesopotamia. I think the cases of Rose Bradford[18] were of this type, as also some of my own seen amongst the troops in France, and probably also some at least of those cited by Luccarelli[19] under the title "War Splenomegaly?" I cannot accept the distinction suggested in an annotation in THE LANCET in 1921.[20] It is interesting to note that one of my cases had a heavy trichomonas infection, for an apparently similar case is referred to by Luzzatto.[21]

3. *Enteritis and Splenomegaly.*—This is especially met with in children, and the septic origin is commonly accepted—e.g., by Riviere[22] and Ashby.[23] Morse in a long paper refers the splenomegaly to disturbance of nutrition, but notes that gastro-intestinal disorders were present in each of his 40 cases.[24]

4. *Oral Sepsis and Splenomegaly.*—The cases of Wynter and others have already been cited. In one of my own cases extractions at once relieved serious symptoms and the spleen returned to normal. The normal spleen, however, prolapsed into the lower part of the abdomen and still (two years later) gives rise to some trouble which probably depends on torsion of the pedicle.

5. *Senile Anæmia.*—Cases of chronic splenomegaly have been described under this name by Kurpjuweit.[25] Hasenfeld reported two further cases in 1911. These may have been of the chronic septic type, and it would appear doubtful whether it was worth while to class them separately.

There are scattered through the literature many cases in which one feels that the possibility of a chronic septic splenomegaly has been overlooked, while unnecessary and invalid distinctions have been based on particular blood examinations or other variable features.

Conclusions.

I venture to conclude from individual cases, from my own mistakes, and from a review of the literature: (*a*) That the underlying pathological process is the same in all chronic splenomegalies of septic origin; (*b*) that the recognition of this origin will remove a large number of cases from the groups of idiopathic splenic anæmia and Banti's disease; and (*c*) that it will greatly assist treatment.

NOTE.—Since the above was written there has appeared an important paper by A. G. Gibson[26] in which he deals with chronic inflammatory diseases of the spleen. In a personal communication he states, "My own point of view is ætiology first and last, on the view that only by working on these lines will the real relationships of disease be apparent." I am a little disposed to dispute this thesis, but by no means willing to depreciate the value of the work which it inspires, and anyone interested in the subject should consult the various papers which Gibson has published. In *Medical Science* for May, 1921, will be found extracts from various papers on splenomegaly, but since then, with the exception of Gibson's article, no paper of first-class importance has come to my notice.

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ATTACKS OF ARRESTED RESPIRATION IN THE NEW-BORN.

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IN the majority of text-books of midwifery and diseases of children asphyxia of the new-born is described under the traditional headings "asphyxia livida" and "asphyxia pallida," and some books go further and describe how in some infants respiration is never fully established and after some hours or days of hurried, feeble breathing respiration gradually fails altogether and the infant dies, a condition sometimes described as "extra-uterine asphyxia," and attributed to congenital atelectasis.

The condition to which I wish to draw attention is a form of respiratory failure differing from any of these and occurring not only in the first few days after birth, but sometimes in infants some weeks old. In the few cases which I have seen it has been regarded by the medical men in attendance as a condition with which they were quite unfamiliar, so that it seems worth while to give some detailed description of it.

Reuss, in his text-book "Diseases of the New-Born," refers to cyanotic attacks in connexion with premature infants and also under the heading "atelectasis." He lays no stress upon the sudden arrest of respiration, which is the striking feature of the cases to which I am referring. Perhaps I shall best describe them by drawing up first a composite picture based on the very small number of five cases which constitute the whole of my experience of this condition, which is therefore probably not frequent.

General Features.

An infant aged, it may be, only a few hours or it may be a few weeks, has given no cause for anxiety; the labour perhaps was normal, there was no asphyxia at birth and all seems going well, when the infant who has been left apparently perfectly well a few minutes previously in its cot, is found leaden-coloured or pale, having entirely ceased to breathe; artificial respiration starts the infant breathing again, and by the time the doctor arrives the whole upset sounds like a false alarm, the infant is lying placidly in its cot with good colour, breathing perfectly comfortably, and the unwary might think that the story was exaggerated. But in a few hours the infant is again found in the same condition; without the slightest sign or warning respiration has stopped, and only by prompt artificial respiration is life again saved. So the story goes on for a day or two, and then probably in one of the attacks breathing cannot be restored and the infant dies.

From five cases one cannot ascertain at what age such attacks are most liable to occur, but I can state positively that they are not limited to the first day or two after birth. One of my cases began his attack at 4 weeks, and another when 4 weeks 5 days old. Any delimitation of the new-born period must be purely arbitrary, but if Reuss's limit of "the first two or three weeks" is adopted neither of these two cases was new-born. The age at which the attacks began were respectively about 16 hours, 26¾ hours, 5 days, 4 weeks, and 4 weeks and 5 days.

Antecedent Conditions.

Unfortunately I have no notes of the character of the labour except in two, in neither of which were instruments used. In one of these, the case in which the attacks began at the age of 26¾ hours, labour had lasted 34 hours and presentation was occipito-posterior, and the mother had had ¼ gr. morphia nine hours before the child was born, and two doses of bromide and chloral, 20 gr. of each, twice before the morphia; chloroform was given on and off during the labour. I mention these details, which I have kept only in that one case, because it might be suggested that sedative drugs given to the mother may have an inhibitory effect upon the respiratory centre, as happens in opium poisoning. That such a cause is generally responsible for these attacks is not likely, for the effect of drugs given to the mother during the labour would hardly account for the onset of such attacks so late as four weeks after birth.

The infants with these attacks are not necessarily feeble or ill-nourished, the infant who began them at 26¾ hours old weighed 9 lb. at birth, and the infant who began them at 4 weeks and 5 days, though he had weighed only 5¼ lb. at birth, weighed 8 lb. when the attacks began. Asphyxia at birth is certainly not a necessary antecedent; in the case just mentioned it was specially noted that he breathed at once, and the infant whose mother had had morphia was stated to have had no asphyxia; it did not cry well at birth, but started breathing readily with slight smacking. Of my five cases four were boys; it remains to be seen whether this predominance of males is more than a coincidence in such a small series. If prolonged labour specially predisposes to these attacks, one might expect them to occur more often in the first-born than in later children; but so far as my own small figures go this would not appear to be so, for in three of them I noted the number of the pregnancy: they were the fourth, fifth, and eighth pregnancies respectively.

Onset and Nature of Attacks.

Reverting now to the character of the attack, I should like to lay stress upon certain points. The individual attacks came on without any apparent reason, they were not traceable to crying or flatulence or any such exciting cause. They have, in my experience, usually occurred when the infant was lying placidly in its cradle. The onset is absolutely silent, there is no crying, no struggling, no stridor, no apparent distress, the infant simply ceases to breathe, and apparently, as a rule, this cessation is abrupt and complete. In one only of my cases, a fatal one, the respiration gradually became slower, then ceased, and returned gradually after an interval of one and a half minutes, so that the attack was very like an exaggerated Cheyne-Stokes respiration except that it occurred as a single attack, not in a continuous series. In all the rest there was no gradation, respiration simply ceased. A very striking feature of all of them was the perfectly healthy good colour of the infant during the intervals between attacks. The actual attack was accompanied by more or less cyanosis, and this occurred so nearly simultaneously with the cessation of respiration that it was difficult to say which came first, cyanosis or arrest of respiration. In some of the cases the respiration was somewhat shallow and quick in the intervals, but in none was this so marked as to have caused any anxiety if the attacks had not occurred; indeed, I do not think it would have attracted attention at all. The heart continues to beat steadily for some time after the respiration has ceased. I have particularly noted in some of my cases how strong and healthy the heart beat was in the intervals between the attacks, so that the latter would seem not to be due to any general feebleness, but rather to some affection of the respiratory centre. There seems to be no reason to suppose that the respiration would start again spontaneously except when the arrest is of the gradual character, which occurred in one case already mentioned, and, indeed, even with artificial respiration it is sometimes difficult to restart it, so that there is grave risk to life in any attack. The number of attacks varies greatly. In one case there were four in one day and two the next, and then the attacks ceased and the child recovered. In another there were six or seven attacks in the 24 hours, and these continued to recur for seven days before death occurred.

Prognosis.

The outlook would seem to be very black; only one of my five cases recovered. Here, again, I would emphasise the deceptiveness of the infant's appearance in the intervals between the attacks. A fairly

nourished infant with good pink colour, lying comfortably in its cradle with no sign of anything amiss in heart or lungs, is not suggestive of any particular respiratory danger. It was of just such an infant as this that I gave a hopeful prognosis to the parents, and five minutes later, before I had left the house, another attack occurred which proved fatal. Obviously such attacks as these may have an important medico-legal bearing, for it is possible that the first attack of this kind might prove fatal, and, indeed, would almost certainly do so unless someone happened to observe the cessation of breathing, so that death might easily be attributed to overlaying or some more sinister cause, when an apparently healthy infant had without any apparent illness been found dead in its mother's bed or in its cot.

What is the meaning of these attacks? Are they primarily of pulmonary origin, or are they, if I may so say, syncopal attacks in the respiratory centre? It is difficult to see how atelectasis, assumed to date from birth, can account for attacks postponed until the infant is several weeks old, which has happened in some of my cases. Moreover, the condition of the infant in the interval between the attacks is, as I have pointed out, curiously unsuggestive of respiratory trouble. I have made two post-mortem examinations. One showed a certain amount of collapse in the bases of both lungs and probably a very early commencing broncho-pneumonic process; but the attacks had occurred several times daily for seven days before death, so that it was at least as likely that the atelectasis was the result as that it was the cause of the attacks. In the other case there was more extensive atelectasis, the greater part of the right lung and part of the left lower lobe being atelectatic, but here again, who shall say whether the atelectasis was the result or the cause? The infant had several attacks daily from the age of 5 days old, until he died at the age of 15 days. Is it not likely, indeed almost certain, that more or less extensive collapse would result from such repeated bouts of arrest of breathing? The appearance of the attacks, their sudden onset, and the good condition of the infant during the intervals is more suggestive of some affection of the respiratory centre than of any secondary asphyxia from insufficient expansion of the lung.

Treatment.

If life is to be saved in these cases, it is all important that the sudden and absolutely silent onset of the attacks should be borne in mind. It is essential that the infant should be watched closely by someone night and day until the attacks have been entirely absent for some days. At any moment artificial respiration may be the only hope of saving the child's life, and the nurse or mother must be instructed accordingly. I have had oxygen used in the attacks, and it probably helps in re-establishing respiration; it is certainly worth while to devote unremitting attention to these infants, for although recovery may be the exception, there is undoubtedly the possibility of saving them, and this will depend largely upon careful watching for the first moment of arrest of breathing. Any delay in beginning artificial respiration can only diminish the chance of recovery.

THE TREATMENT OF CHRONIC INTESTINAL STASIS BY COLLOIDAL KAOLIN.

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KAOLIN, in one form or another, has long been in use as a therapeutic agent. In radiological practice I have found it a convenient substance for opaque enemata mixed with barium sulphate and warm water. In colloidal form it is in a state of very fine subdivision. When I began to study the properties of colloidal kaolin as an adsorbent of intestinal toxins, I was struck with its efficacy, and the benefit derived from its administration in stasis. Others, to whom I introduced it, reported similar favourable results, and the time has come to publish an account of its use in the treatment of stasis.

Intestinal stasis is, I am convinced, at the root of most of the disorders of digestion, and the toxæmia of stasis is responsible for a number of local and general disorders. These have been fully described and explained by Sir Arbuthnot Lane in his classic writings; they are also dealt with in my papers on stasis.[1]

Surgical Treatment of Stasis.

Stasis demands surgical intervention: (*a*) when it has led to a local disease, such as gastric or duodenal ulcer, gall-stones, an appendix abscess, or an obstructive kink; (*b*) when the stasis has been allowed to advance to the stage of permanent incurable disease of the large intestine, so that excision of the diseased bowel offers the only chance of cure. Dental surgery must repair the havoc wrought in the mouth by neglected stasis. Surgical intervention will become rare when stasis is recognised early, and treated before organic mischief has arisen.

Non-Surgical Treatment of Stasis.

The successful treatment of stasis demands an exact knowledge of the pathological conditions present, obtained by (*a*) a complete history and full account of the symptoms; (*b*) a careful physical examination; (*c*) a chemical, histological, and bacteriological investigation of urine and fæces, and a chemical and histological examination of the blood; and (*d*) a complete X ray investigation of the alimentary tract with a bismuth meal and a barium enema.

(*a*) Stasis usually starts in the large intestine, and the start can be traced to infancy or early childhood. The prevention of constipation and of gastric distension in childhood does much to ensure a healthy youth and a vigorous adult life. Take a typical case of stasis as seen in middle life, say between the ages of 45 and 55. The patient looks careworn and unhappy; his skin is dry and wrinkled, and he looks older than his years. He complains of headache and aching limbs; his muscles are stiff and easily fatigued, his joints rheumatic; he is subject to lumbago, sciatica, or neuritis. His digestion is faulty and he suffers from flatulence and "heart-burn" with foul breath and a coated tongue. There is constipation, perhaps alternating with a form of "diarrhœa" characterised by loose stools, full of mucus, and very offensive. The patient is short of breath on slight exertion.

(*b*) The physical examination of the abdomen reveals thickening of the wall of the iliac colon and of the terminal ileum; pressure upon these parts causes pain. Thickening (and pain on pressure) may be felt also over the pylorus, at the duodeno-jejunal junction and in the position of the gall-bladder. A succussion splash is often elicited in the stomach.

(*c*) The pathologist finds in the urine the products of intestinal putrefaction, and in the fæces the bacteria that are causing putrefaction. He also finds an excess of mucus from the catarrhal mucous membrane.

(*d*) The radiologist finds some or all the abnormal conditions described in my papers on stasis. In a typical case the pelvic colon is elongated; the splenic flexure is sharply angulated in a high position; the cæcum, ascending colon, and transverse colon are dropped. The descending and iliac colon are narrowed by tonic spasm due to catarrh of the mucous membrane (mucous colitis). The catarrh causes exaggerated segmentation of the cæcum, ascending and transverse colon. Small amounts of fæcal material are forced with mucus through the narrowed descending and iliac colon, while the main fæcal mass remains

[1] Proc. Roy. Soc. Med., 1911, vol. v.; 1913, vol. vi.; 1915, vol. viii. Brit. Med. Jour., 1913, ii., 915; 1920, ii., 959. Practit., February, 1913. THE LANCET, 1920, i., 756. Also Sir Arbuthnot Lane's Operative Treatment of Chronic Intestinal Stasis, Chapters 2 and 13.

imprisoned in the cæcum and ascending colon. A barium enema shows not only the elongation of the pelvic colon and the sharp bend of the splenic flexure, but also the large capacity of the cæcum and ascending colon. The habitual overdistension of the cæcum stretches the ileo-cæcal valve, and allows some of the enema fluid to leak through the valve into the ileum. Incompetence of the ileo-cæcal valve leads to spasm of the ileo-cæcal sphincter, and this causes stasis in the lower coils of the ileum, and hypertrophic thickening of the terminal coil of the ileum. Ileal stasis gives rise to kinking at the duodeno-jejunal junction and distension of the duodenum. Pyloric spasm is set up, and causes delay in the evacuation of the stomach. The pyloric spasm of stasis is exceedingly persistent and obstinate.

Treatment.

How are these changes best dealt with? The X ray findings having excluded all conditions which require surgical intervention, treatment may be prescribed with every prospect of success. The chief measures are the following:—

1. The dropping of the stomach and large intestine is corrected by a Curtis belt.

2. Stasis in the large intestine is met by prescribing liquid paraffin. If the pelvic colon is much elongated warm saline enemata should be given in addition.

3. Spasm of the sphincters (pyloric and ileo-cæcal) and spasmodic constriction of the large intestine are best overcome by belladonna, 8 or 10 minims of the tincture with a little bicarbonate of soda twice a day after food.

4. Decomposition in the intestines is dealt with most effectively by means of colloidal kaolin, a dessertspoonful of the kaolin powder if taken in half a tumbler of hot water night and morning.

5. The septic contents of the lower ileal coils must be cleared out by salines. Streptococcal infection of the intestines most often occurs in the lower ileum; few streptococci pass on into the cæcum and still fewer reach the rectum. This has been proved by withdrawing material from the intestines during abdominal operations. Bacteriologists are able to grow streptococcal cultures from the fæces by giving their patients lactose (with the object of increasing the growth of streptococci for the time being), and a saline aperient to propel the streptococcal chyle into and through the large intestine. Applying this experience, colloidal kaolin is given to adsorb the intestinal toxins, and a saline aperient to drive onward the contents of the lower ileum.

All the above measures aid one another in breaking the vicious circle of stasis. The paraffin helps the Curtis belt to support the dropped viscera; it makes the fæces specifically lighter than the watery contents of the small intestine, so that the large intestine tends to float up, instead of being the heaviest part of the intestines as it is when full of solid fæces. The belt, in its turn, helps the action of the paraffin and saline aperient by supporting the viscera, abolishing kinks, and preventing traction of the viscera upon the mesenteries. The belladonna helps in three ways: (1) it opens the "gates" (i.e., the sphincters); (2) it diminishes spasmodic narrowing of the large intestine; (3) it antagonises the vaso-constrictor action of the intestinal bacterial toxins, and thus acts as a physiological antidote to these toxins.

Colloidal Kaolin in Stasis.

The advantages to be derived from colloidal kaolin are: 1. It adsorbs bacterial poisons in the intestines, and is a potent and efficient agent in rendering these poisons innocuous. 2. It soothes the mucous membrane. 3. It has a very useful mechanical action in the large intestine. In conjunction with paraffin it converts the fæces into a soft, homogeneous mass which passes through the big bowel readily. Patients who have given up liquid paraffin because it "runs through" are able to take it in conjunction with colloidal kaolin. With a little care in dosage it is possible to maintain motions that are smooth, soft, and almost odourless like those of a baby.

In severe cases of intestinal stasis the large intestine is elongated, dropped, and angulated, its walls catarrhal and sodden, its mucous membrane congested and perhaps eroded, its contents hard and foul and covered with offensive mucus. The lower coils of the small intestine lie in a "pool" in the pelvis, full of stagnant fluid which teems with virulent organisms, pouring out poisonous products, to be absorbed into the circulation unchecked. This stagnant pool has but one outlet—through the ileo-cæcal valve—and this outlet is barred by spasm. This is no exaggerated picture, it is the condition which exists in an appreciable proportion of civilised men and women. The *least* adverse result is a general decline in health and vigour. Those who are less able to resist the poisons suffer from headache and various forms of digestive disturbance, or from spasmodic asthma. Others are victims of lumbago, neuritis, and rheumatic fibrositis. Still worse off are those who become tuberculous or cancerous, and most unfortunate are the epileptics and the insane.

Now see how rational and effective is the treatment. Start with paraffin and a Curtis belt. The bowel is supported so that it no longer drags on the mesentery, kinks are abolished, the fæces are softened (by the paraffin) so that they can be evacuated with little effort. The belt aids the feeble toxic abdominal muscles during defæcation. Now add colloidal kaolin. Most of the kaolin collects in the lower ileal pool, adsorbs toxins there, and makes the foul contents of the lower ileum innocuous. Next add belladonna. It opens the sphincter and widens the narrowed large intestine. Lastly add a saline. It clears out the lower ileal cesspool, already "treated" with kaolin. The saline and the paraffin together effect the speedy evacuation of the large intestine. If the pelvic colon is much elongated a course of enemata is needed to complete the evacuation. Colloidal kaolin may most usefully be added to the enema fluid—an ounce of kaolin to each pint of warm enema fluid.

Vaccines.—Autogenous vaccines are of considerable help in many cases.

Diet.—Correct feeding is of great importance in the treatment of stasis. The details of diet must vary to suit individual needs, but certain principles of diet may be laid down. Articles to avoid are: (*a*) Those which irritate the mucous membranes, especially alcohol and sharp spices (mustard, cayenne, &c.); (*b*) those which decompose readily in the intestines. Meat is the most important of these, and it includes poultry and game. Excess of sugars should be avoided as encouraging streptococci.

Foods to take are: (1) Fresh fish; (2) fresh dairy produce—eggs, milk, cream, butter, cheese; (3) fresh garden produce—lettuce, fruits, and vegetables; (4) grains of all kinds, including coarse oatmeal; (5) nuts. Large meals should be avoided; the "static" stomach cannot deal with them.

Régime.—The principles of régime may be tabulated thus: 1. Avoid fatigue, whether physical or mental. 2. Retire early and spend a long night in bed. When commencing treatment, it is often well to advise three weeks of complete recumbency, and to impose a rest of two hours after lunch for some weeks more. 3. Cultivate regular habits, and acquire the faculty of having a soft (not liquid) fæcal evacuation after each meal. A routine visit to the lavatory after each meal may remain unrewarded at first, but a few weeks' education will enable the bowel to respond satisfactorily—with the aid of paraffin, kaolin, and belladonna.

Results of Treatment of Stasis.—The rewards of perseverance with treatment on the lines I have laid down are manifold. Dyspepsia, heart-burn, flatulence, and many other everyday disorders of digestion yield. The appetite improves; the patients gain weight, improve in complexion, and acquire a healthy look. They enjoy a grateful feeling of comfort, vigour, and good health. Rheumatism, neuritis, asthma, and many other toxæmic troubles of stasis clear up in a most gratifying way under colloidal kaolin saline in conjunction with paraffin and belladonna.

Colloidal Kaolin in Common Ailments.—There are many common ailments—not primarily or necessarily due to stasis—in which alimentary toxæmia occurs, and where colloidal kaolin has been found most useful, such as bronchitis, pharyngitis, and infantile diarrhœa.

In the epidemic illnesses of children (measles, whooping-cough, &c.) colloidal kaolin is a great stand-by. It helps the children through the bad days with the minimum of discomfort to themselves and of anxiety to the parents and nurses. A dose of calomel is a good prelude to the treatment with kaolin, belladonna, and paraffin. The morning sickness of pregnancy is alleviated, and kept at bay in many instances. During lactation both mother and child reap the benefit of the cleansing action of colloidal kaolin saline, given to the mother with paraffin if need be.

Colloidal Kaolin in Tropical Affections.—Colloidal kaolin, with or without saline, is the best remedy known in colitis and dysentery. It checks the diarrhœa and soothes and heals the eroded or ulcerated mucous membrane. Asiatic cholera has lost most of its terrors since it has been shown to yield to frequent draughts of kaolin in watery suspension. Further experience will undoubtedly add to the range of usefulness of colloidal kaolin. Colloidal kaolin of uniform composition and free from impurities, organic as well as inorganic, have been prepared for me by the Collasan Company (20, Holborn Viaduct E.C. 1), who supply it, by itself and with saline aperient, under the names of "Collasan" and "Collasan-Saline." When it is deemed advisable to prescribe collasan without saline, or to prescribe the saline separately, the following formula is recommended by Dr. A. White Robertson:—

Collasan (colloidal kaolin) .. 3½ oz. | Water .. 8½ oz.

Add the water to the collasan in a large basin, stirring thoroughly to form a fine cream. Now add, constantly stirring, 1 oz. of mucilage of tragacanth and 10 minims of oil of peppermint (or oil of dill). A port-wine glassful to be taken every six hours.

Clinical and Laboratory Notes.

GONORRHŒA IN WOMEN

TREATED WITH CONTRAMINE PESSARIES.

BY G. W. RUNDLE, L.R.C.P. & S. EDIN., L.R.F.P.S. GLASG.,

RESIDENT MEDICAL OFFICER, LONDON LOCK HOSPITAL FOR WOMEN.

IN June, 1921, I published some notes[1] on the treatment of gonorrhœa in women with intramine pessaries, showing the very satisfactory manner in which the discharge vanished. Though this method of treatment proved superior to all others, it had one drawback, in that 8 per cent. of the cases developed a local dermatitis. To obviate this development, Mr. J. E. R. McDonagh has elaborated a more active preparation of sulphur, di-ethyl-ammonium di-ethyl-di-thio-carbamate (contramine), which has all the advantages of intramine, with none of the disadvantages. Contramine pessaries have been used in the London Lock Hospital for over a year, and not a single case of dermatitis has resulted. Further, the discharge disappears quicker and the erosions heal more rapidly than was the case with intramine pessaries.

The course consists of a pessary placed against the cervix nightly when the patient is in the recumbent position, the pessary being retained in position by a gauze tampon, which is taken out next morning. One of the great advantages of contramine pessary treatment for a discharge of any origin over the douching and speculum treatment is that patients can insert these pessaries at night by themselves in secret. Patients like this pessary treatment because, apart from the rapidity of clearing the discharge, it is obviously convenient for a patient to be able to keep the pessaries, say in a chocolate box, and administer one to herself nightly unobserved, even when other females are in the same room. To carry out vaginal treatment in secret with a douche is a great strain on a patient's ingenuity and happiness.

Contramine pessaries should only be used when the discharge is chronic. One hundred cases have been treated; in only seven cases was the gonococcus found before treatment, and in none was it found after treatment, though all cases had a definite vaginal discharge. But most observers agree, I think, that to find the gonococcus in the adult female in a chronic discharge is very difficult. These cases received 30–40 pessaries each, no other treatment was prescribed, and they were kept under observation for two months without treatment before being discharged. So far only four cases have relapsed.

[1] THE LANCET, 1921, ii., 802.

FRACTURE OF THE HEAD OF THE FIBULA.

BY A. W. LEMARCHAND, M.R.C.S. ENG.

THE following is a record of an unusual accident which occurred to a man, aged 56, who was standing close by the side line, watching a Rugby football match. A full back went to charge an opposing forward, missed his man, fell, and struck his head against the outer side of this spectator's knee. The accompanying tracing of an X ray photograph of the knee shows the fracture of the head of the fibula which resulted. There was no displacement and no appreciably increased lateral movement.

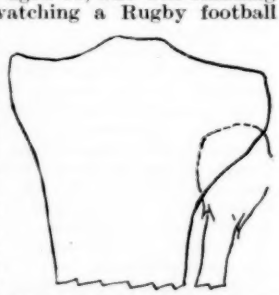


Diagram traced from X ray photograph of fractured head of fibula.

I should be glad to hear if any reader of THE LANCET who has had experience of a similar injury can state whether any trouble followed in the nerve which lies behind the head of the fibula.

Barnstaple.

A CASE OF "INFECTIOUS MONONUCLEOSIS."

BY P. D. H. CHAPMAN, M.B., B.CH. CAMB., M.R.C.S. ENG.

THE interesting annotation on Infectious Mononucleosis and its possible causation, which appeared in THE LANCET of Feb. 17th, prompts me to relate a recent case of mine, which corresponded very closely to the description of this disease. The patient was a boy of 17; the first symptoms were enlargement of cervical glands and pyrexia, the throat remaining normal in appearance until the ninth day of illness, when a very acute follicular tonsillitis occurred. By this time the submaxillary, axillary, and inguinal glands were also enlarged and pyrexia had been continuous. The white cell count on the fifth day was 15,000 per c.mm.; the differential count was: mononuclear lymphocytes, 56 per cent.; polymorphonuclear leucocytes, 38 per cent.; hyalines, 6 per cent.; eosinophiles, nil. The progress of the case was uneventful, the blood count returned to normal, and all glands became no longer palpable within 20 days of onset. It is difficult to see how an infection of the throat could be considered as a cause of the disease in this case.

Bridlington.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

A MEETING of this section was held on Feb. 16th, when Sir CHARLES BALLANCE, Vice-President of the section, occupied the chair.

Mr. G. J. JENKINS delivered a contribution entitled

Osteitis Deformans and Otosclerosis: a Pathological and Clinical Comparison,

and showed a number of micro-photographs of the conditions found. He considered the subject under the following headings: 1. A comparison of the pathological changes in bone in osteitis deformans and otosclerosis respectively. 2. A comparison of the clinical aspects of osteitis deformans with otosclerosis. 3. Conclusions. He showed serial sections from the temporal bones of three subjects: (*a*) female, aged 84, with cephalic osteitis deformans; (*b*) the temporal bone of a male, aged 61, who had osteitis deformans of the skull and long bones; (*c*) from a male, aged 41, who had otosclerosis and severe tinnitus. This series was selected because it showed the general affection of the capsule of the labyrinth. The microscopical appearance in both conditions was that of osteoporosis. The trabeculæ of bone in osteitis deformans were more coarse, and the lamellæ more distinct than in otosclerosis. The dense bony capsule of the labyrinth afforded most resistance to the progress of osteitis deformans. The large osteoclasts, obvious in all the sections, were more numerous in otosclerosis specimens. The proliferation of fibroblasts was more evident in otosclerosis; but the fibrous tissue was the more prominent feature in osteitis deformans. In some parts the marrow of the bone was in close contact with the endostium. In both diseases he found a deposit of what was probably fibrinous material, and this took the selective stain for amorphous fibrin. In both conditions the stapes remained free from disease. Bone conduction was usually diminished in otosclerosis; this was more evident with low tones than with high. The Rinné test in typical otosclerosis he regarded as of the first importance; a negative Rinné to tones below 200 was one of the valuable signs of that disease. Typical otosclerosis cases heard better with electrical aids; this latter fact carried one a long way in diagnosis.

The symptoms and signs of typical cases were due to the site of activity of the disease, which could produce other forms of deafness if it occurred in other parts of the labyrinth. Sometimes he had found typical otosclerosis symptoms in one ear, and in the other ear only a loss of bone conduction. He was inclined to look upon otosclerosis rather as an accident of disease than as a disease sui generis. In all cases of osteitis deformans in which the skull bones were markedly affected the patients were deaf. This deafness was not accidental. If there was a certain degree of similarity, clinically and pathologically, to what did these observations lead? Were the two conditions identical? Against this view was the absence of any hereditary tendency in osteitis deformans. Otosclerosis usually began in early life, osteitis deformans was recognised late in life. In osteitis deformans one did not find a family history of otosclerosis. If the two diseases were due to the same fundamental cause, the difference in distribution must depend on the individual; and in otosclerosis the peculiarity which rendered the person liable to the affection must be hereditary. The causes of these bone diseases might be quite distinct, but it was one characteristic common to both which produced the change in the labyrinth and the consequent similarity in the signs of the deafness. All the patients had had the Wassermann test carried out twice at two institutions each, and all had been X rayed to make sure of the distribution. Mr. Jenkins gave the clinical details of nine cases.

Sir CHARLES BALLANCE congratulated Mr. Jenkins on the beauty of his specimens. It was a very important subject to be investigated, and he hoped the research into the intimate pathology of these two diseases, especially osteitis deformans, would be continued. He had operated on these cases in the old days, but had always found it impossible to get beyond the disease in the skull; there was always a local recurrence. Fibrinous deposits were described as occurring in the cochlea; these usually meant inflammation.

Mr. ALBERT A. GRAY said he thought this was the first time that the similarity of the changes in bone in otosclerosis and those in other bone diseases had been demonstrated. He had often suspected there might be a similar change accounting for the spontaneous fractures occurring in locomotor ataxy. He did not feel quite satisfied that otosclerosis always began with evidence of nerve deafness. The earliest case of otosclerosis of which he had cut sections was one in which the deafness had existed three years, and there was very definite bone change at that stage. It would be interesting to know what was the view of pathologists as to the causation of osteitis deformans. Both the diseases under discussion might be nutritional—i.e., the blood supply to and the nutrition of the bone might be affected in both.

Mr. SYDNEY SCOTT spoke of his examination of a number of cases of osteitis deformans many years ago. One of the sections was exactly like one Mr. Jenkins showed on the present occasion. The osteoporosis in his cases was diffuse. It was curious that osteitis deformans patients should so often succumb to malignant disease. The occurrence of fibrinous exudate might be a mere coincidence; he did not know that it denoted any change in the labyrinthine fluid.

Mr. RITCHIE ROGER said that of 75 cases reported at least 6 showed a definite hereditary history. Some help in arriving at the ætiology might be obtained by a study of the secretion of the endocrine glands.

Sir J. DUNDAS-GRANT described some cases of osteitis deformans of his own which had obstructive deafness. Also one in which the trouble was vertigo and deafness, with probably some optic neuritis. He diagnosed cerebellar tumour. The man was received into an infirmary, where he was said to have osteitis deformans. The post-mortem revealed a cerebellar tumour.

Mr. JENKINS replied, pointing out the importance of distinguishing between internal-ear deafness and nerve deafness. At present the nomenclature was too general. He could not be certain that it was fibrin in the labyrinth, it was a fibrinous deposit, which gave Gram-positive in staining.

Cases of interest were shown by Sir J. DUNDAS-GRANT, Mr. J. F. O'MALLEY, Mr. E. D. DAVIS, and Dr. H. J. BANKS-DAVIS.

SECTION OF OPHTHALMOLOGY.

EXHIBITION OF CASES AND SPECIMENS.

A CLINICAL meeting was held at the Royal London Ophthalmic Hospital (Moorfields) on Feb. 9th, Mr. A. L. WHITEHEAD, the President, being in the chair.

Optic Atrophy after Herpes Ophthalmicus.

Mr. LESLIE PATON exhibited an interesting example of this condition. The patient, a woman aged 67, had, at Easter of last year, a bad attack of ophthalmic herpes which affected all the branches of the first division of the fifth nerve on the left side. Faint nebulæ resulting from corneal vesicles were left. On recovering from the herpes the patient found she could not see with her left eye, and it was discovered that the left pupil did not respond to direct stimulus, but reacted well on consensual stimulation. There was a slight reaction to concentrated light. Ophthalmoscopically, an opaque white disc was seen, but the lamina cribrosa could not be seen. There was no obvious disturbance of retinal pigment round the edges of the disc. The calibre of the vessels was reduced. The complication of ophthalmic herpes by true optic neuritis was comparatively rare. Mr. Paton had

not seen a case until last summer when a patient, aged 35 years, of Mr. Adams, of Oxford, was seen by him. When her right eye was opened after the herpes had subsided it was found to be quite blind; the pupil was semi-dilated and did not react to light at all. Her tension was normal, and the ophthalmoscope revealed an absolutely atrophic disc. In Sir Jonathan Hutchinson's classical account of the condition (Ophthalmic Hospital Reports, vol. v.) he said the globe was never affected except when the naso-ciliary branch of the first division of the fifth was involved; but there were exceptions to this. Still, this statement was of great service in prognosis. Mr. Paton reminded the meeting of reports of other cases with the same complication. Evidence of other cranial nerve involvements was more frequent. In the epidemic of last spring he saw three or four cases of diplopia, and later, one in which the sixth nerve was affected. Statistics showed that the third nerve was more often concerned, while the nerve-supply of the iris and ciliary muscle was not uncommonly affected. One of his cases had no superficial vesicle on the cornea, but there was a well-marked deep keratitis with irido-cyclitis. In last year's epidemic he had noticed definite hypotony. The evidence available seemed to show that the changes in the optic nerve were secondary to the peripheral changes in the circulation produced as the result of the herpes. It was important to differentiate cases in which the herpes occurred from an implication of the Gasserian ganglion, or the branches of the fifth, by any other associated intracranial condition, from the true cases of herpes ophthalmicus, due probably to an infection of the Gasserian ganglion. As to the supposed relationship between this infection and chicken-pox, further information was much needed, but it was steadily accumulating; he had shown a case of optic atrophy resulting from retro-bulbar neuritis during chicken-pox, and in several cases he had traced a relationship between ophthalmic herpes developing in adults with cases of chicken-pox in children.

Mr. R. PICKARD related a case of his own in which persistent blindness of the affected eye followed an attack of the disease, another case which seemed to show an association between herpes and chicken-pox.—Mr. W. H. MCMULLEN spoke of a case now under his care in which optic atrophy followed herpes.—Mr. H. W. M. KENDALL described a case showing an intimate relation between chicken-pox in a child and herpes in his mother.

Cicatrisation of the Retina.

Mr. FRANK JULER showed a child the subject of this condition. He had been sent from school in the ordinary way because of defective vision, and the ophthalmoscope revealed a half circle of fibrous-looking tissue, involving the macular region, and along the edge of the tissue there were hæmorrhages. Six months earlier a rubber ball had struck that eye, and it might have ruptured the retina and the choroid beneath, and hæmorrhage therefrom having now become organised.

Bilateral Tubercle of Choroid in a Cat.

Mr. J. B. LAWFORD and Mr. H. NEAME showed sections from the eyes of a kitten 5 months old, which was found to have bilateral tubercle of the choroid, with detachment of the retina. The animal had not wasted, nor refused food, which was chiefly the household milk. Complete blindness existed, and it had come on rapidly. The pupils were dilated and did not react to light. In each eye was an extensive detachment of retina, and no part of either fundus was visible. Its end was brought about by chloroform. Another kitten from the same litter was quite healthy and well grown, and there seemed to be no abnormality in the eyes.

Mr. NEAME described the pathological condition found. The posterior part of the choroid was definitely thickened and the retina completely detached. There was some conjunctival and episcleral infection, and some cells in the angle of the anterior chamber and round the ciliary processes. Even a long search through the sections did not disclose tubercle bacilli, but that was not an uncommon experience in tuberculous conditions, especially in animals' eyes, and it did not contradict the diagnosis of tubercle.

Sub-Hyaloid Hæmorrhage.—Band Keratitis.

Mr. M. S. MAYOU exhibited a girl who, after rubbing her eye, had a sub-hyaloid hæmorrhage. The blood count was normal.

Mr. A. C. HUDSON showed two patients with band keratitis, in neither of whom could any cause be discovered. In one of the patients he scraped away the film with such a good result that the vision was improved from less than 6/60 to 6/12. Laboratory investigation of the specimen did not lead to a very definite opinion as to its nature, but it was not thought to be calcareous.

Mr. PATON agreed that these patients were very tolerant to scraping, and gave some experiences supporting this.

Atrophic Patches at Macula.

Mr. F. A. WILLIAMSON-NOBLE showed a married woman, aged 36, with this condition. She had had several operations for tubercle, and since 1920 the vision in the left eye had been getting worse, until it was less than 6/60. The vision in the right eye was also only 6/60. In the right eye the internal limiting membrane could be seen to be pushed forward 3 D., for vessels could be traced coming from the disc and the parallax showed the membrane to be in front of the rest of the disc. In the lowest part of the patch was an impairment, suggesting that a hole existed in the membrane.

Mr. R. A. GREEVES suggested that the appearance might be due to a thin-walled cyst in that area.—Mr. PATON thought Mr. Greeves's suggestion a likely one. The fibres of Müller might have been ruptured, and the membrana limitans interna lifted forward; he had seen that occur in the course of papillœdema.—Mr. JULER suggested there might be a new membrane altogether; such were not uncommonly seen in degenerate eyes. If a new membrane formed in front of the retina, the membrane might reach outwards so as to bring a supply of blood to itself.

Cyst of Sclero-Corneal Margin.

Mr. KENDALL showed a patient, aged 17, with this condition. A week ago a foreign body entered the eye, and he sought advice the following morning, when the cyst now seen was noticed. It had been hidden by the eyelids. There was no remote history of an injury, but the eye might have been injured in childhood.

Sir W. LISTER regarded it as an implantation cyst. It was difficult to obtain any history of injury in such cases, as also in implantation cysts of the iris; but an injury could occur without the knowledge of the parents.

Mr. COLLEY, Mr. WILLIAMSON-NOBLE, Miss IDA MANN, and Mr. BARANOFF showed cases of injury, and of coloboma in disc and iris.

SECTION OF PATHOLOGY.

A MEETING of this section was held on Feb. 20th, Prof. J. C. G. LEDINGHAM, F.R.S., the President, being in the chair.

Fermentative Reactions of Different Types of B. Diphtheriæ.

Dr. C. C. OKELL and Miss E. M. BAXTER gave an account of an investigation into the fermentative reactions of the serological types of virulent *B. diphtheriæ* described by Eagleton and Baxter, as well as their unclassified cultures. The most useful agents for differentiating *B. diphtheriæ* appeared to be glucose, saccharose, lactose, dextrin, glycerine, and litmus milk. Glucose and saccharose appeared to be the sugars of most practical use in differentiating the diphtherial from the diphtheroid group. Of 100 strains of virulent organisms all, when quite pure,

fermented glucose and failed to ferment saccharose. Dextrin was fermented by all but one strain of poor growth. A number of avirulent organisms agreed in every particular, morphological and fermentative, with the virulent forms. The authors, in summarising their conclusions, stated that all serological types of virulent *B. diphtheriæ* that they had so far examined had practically identical sugar reactions. Fermentative reactions at present available could not be used to distinguish between the various serological types or between virulent and avirulent forms.

Dr. S. C. DYKE communicated the results of an investigation into the

Inheritance of the Specific Isoagglutinable Substances of the Red Cells,

undertaken by Dr. C. H. Budge and himself in the maternity ward of St. Thomas's Hospital. Ninety-seven unions were observed with 98 offspring. In no case was it found that the isoagglutinable substances A or B of the red cells appeared in the offspring without having been previously present in the blood of the parents, this being in conformance with the hypothesis of von Dungern and Hirschfeld. Placental blood was used for ascertaining the blood group of the infants; it was found that in only 16 out of the 98 cases investigated was it possible to allot the placental blood to its group by means of the agglutinins of the serum; in the remaining 82 the agglutinins were either completely or partly absent. In determining the group of the offspring reliance was consequently placed upon the reaction of the red cells. It was pointed out that 32 of the 98 babies examined appeared to be of a different group from their mothers.

The Disruptive Phenomena in Gunshot Injuries: Their Physics.

Prof. S. G. SHATTOCK, F.R.S., observed that whatever clinical peculiarities gunshot injuries presented, their proper pathological interest as injuries was limited to the fact that the velocity of the missile produced special effects known as explosive, or better as disruptive. As was well known, Prof. Vernon Boys some years ago succeeded in photographing bullets soon after their leaving the rifle, and demonstrated the presence of a conical air-wave accompanying the missile. At first the displacement of air seemed of some importance, but it was quite negligible, although, under the name of "windage," much had once been attributed to it. Amongst other proofs, the author had found that on firing with a service rifle and pointed modern British bullet, at 20 feet, through screens of tissue paper tensely stretched on wooden frames, the aperture in the paper very little exceeded the size of the bullet.

Spin of the Bullet.—The late Sir Victor Horsley attributed the disruptive effects chiefly to this factor. A close study of the plaster casts made from the cavities produced in soft clay by firing directly and at close range into the latter did not, in Prof. Shattock's opinion, confirm the evidence of this: the ridges on such casts presented only slight indications of any obliquity—not more than would be due to the open spiral of the rifling. The most conclusive proof of the absence of spin was furnished by the study of British bullets fired into sand. The apex showed fine scratches due to the sand, which were not spiral but longitudinal. The disruptive factor is thus reduced to that of forward velocity acting upon a mobile and practically incompressible medium, the lung alone excepted, in which no such disruption took place. The lateral disrupting movement was imparted to the medium by the intense compression in front of the bullet, which compression is also exerted sideways, since the conical point simultaneously acts as a wedge. It was in the skull that the disruptive phenomenon was most marked. The effect is still often supposed to be hydrostatic, but it was a hydrodynamic one, as shown by experiments made upon objects with a free exit; for example, upon tins empty and others filled with water, the vessels being freely open at the top. Two clear circular holes were made in the first; in the other, the back was split into large triangular everted flaps. The rate of the wave transmitted by the water is equal to that of the bullet, which as soon as it impinges is accompanied by the receding wave of the water. Similar results were obtained in human and sheep skulls when inverted and filled with water, the foramen magnum being left freely open. If the brain is left in, the same comminution takes place.

The British Rifle Bullet.—It had been asserted (Prof. Stargardt, 1914) that the British missile was designed for expansion; that on striking, the momentum carried the leaden core over the aluminium cone and split the mantle. A study of bullets fired experimentally through calvariæ of different thicknesses, the bullets being recovered in cotton waste behind, showed that on perforating dense bone the momentum caused the lead to splay out or mushroom at the open base, and not at the junction of the lead and aluminium. In the first degree the mantle was evenly turned back over a projecting rim of the lead; in the later, the mantle was split and recurved, the splitting starting at times where scored by the rifling. On compressing bullets in a vice Prof. Shattock found that some of the lead was expressed from the open base, but no displacement occurred over the harder aluminium cone. The cupro-nickel mantle of the British bullet, however, was less resistant than the German of steel. This Prof. Shattock was able to prove by taking samples of each mantle, placing a steel ball over the open end of each and testing by increasing loads the pressure they would withstand. The British mantle began to yield or open out under a load of 180 lb.; the German under a load of 390 lb.

Experimental Carcinoma in the Rabbit.

Dr. J. A. MURRAY showed preparations of two squamous-celled carcinomata of the skin which he had produced in rabbits as the result of eight months' painting with an ethereal extract of tar. The latent period of the development of these tumours corresponded fairly closely with that seen in the mouse. They were likely to prove of great value in the investigation of therapeutic measures, since the rabbit was a particularly favourable animal for this purpose.

ULSTER MEDICAL SOCIETY.

A LABORATORY meeting was held on Feb. 15th, Prof. R. J. JOHNSTONE, the President, being in the chair.

Prof. W. ST. CLAIR SYMMERS demonstrated the presence of melanosis in the tissues of the ox and also some early uterine cancers.

Prof. W. J. WILSON read a short paper on reduction of sulfonites by certain bacteria in media containing a fermentable carbohydrate and metallic salts, illustrated by a number of interesting specimens exhibiting clearly the appearance of sulphide in the presence of iron salts.

Dr. J. A. MILROY described a recent accurate method for the determination of the reaction of solutions (Michaelis' method). In this method a series of indicators showing one colour change (colourless-yellow) is employed. The method enables accurate pH measurements to be made without the use of buffer solutions and has the great advantages of simplicity and rapidity.

Dr. S. ANDREWS described and demonstrated various methods for the detection of traces of blood in urine and fæces.

Prof. J. E. MCILWAINE showed a series of electrocardiograms along with form records of the perfused mammalian heart and the frog's heart. The effects of various cardiac drugs on their records were described and illustrated.

Dr. C. H. G. MCAFEE gave an interesting description of the work done by students in a class of practical pharmacology which was held for the first time during the present winter session. The action of various drugs on blood-vessels, the heart, and intestinal muscle was shown in a series of interesting demonstrations, and the records obtained in the general class work were exhibited.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held on Feb. 26th, Lord DAWSON, the President, being in the chair.

Mr. JAMES BERRY introduced a discussion on the

VARIOUS METHODS OF TREATMENT OF CANCER OF THE TONGUE.

He said that statistics on this subject might be misleading, even those in the excellent report of the Boston Symposium on Carcinoma of Jaws, Tongue, and Cheeks. A common error was to describe a certain percentage of apparent successes amongst so many cases, of which a certain number were advanced cases, and not to mention the proportion of advanced cases amongst the recoveries. Statistics accompanied by sufficient detail about each case to enable the reader to judge of its severity would be most valuable, but were rare. Besides his own operative experience he had had unusually large opportunities of seeing the work of others, and so realised that the ordinary mode of extension of cancer of the tongue was backwards and downwards towards the hyoid bone. Operations for such a cancer should often extend widely in the two directions, and this could not be sufficiently effected by an intrabuccal operation. After emphasising the importance of early treatment of tongue lesions and of the excision of all doubtful ulcers, &c., for microscopic examination, Mr. Berry stated his belief that an external or submaxillary operation offered the best chance of relief for advanced cases, for which, even if not curative, the operation afforded relief of the distressing condition within the mouth. He did not agree with procedures involving splitting the cheek or dividing the lower jaw. The disease was essentially a local one with very little tendency to distant metastasis, but owed its malignancy to its tendency to affect the cervical lymphatic glands at an early stage. Early free removal of the primary growth with a removal en bloc of the nearest lymphatic glands offered hope of permanent cure. But if the growth originated in the posterior part of the tongue the deeper cervical glands (especially the post-pharyngeal glands), which were early affected, could not be removed en bloc and permanent cure could hardly be expected. He doubted whether the so-called "block dissection," with removal of jugular veins and sterno-mastoid, was ever worth doing. It was seldom necessary for cases where the growth was situated on the anterior part of the tongue, and he believed generally useless for advanced cases when the growth was situated posteriorly. Further, he thought it probable that unsuccessful attempts to dissect out affected glands merely favoured the spread of the disease. The class of case which Mr. Berry had dealt with had been mainly those of cancer of the middle and posterior thirds of the tongue.

Operative Treatment.

For small carcinomata of the anterior half of the tongue, not involving the floor of the mouth, he believed that the removal of one-half of the tongue, followed later by the free removal en bloc of all structures in the sub-maxillary, and if necessary the submental, region of one or both sides was generally the best operation. For larger growths, wherever situated, and for all growths of the middle and posterior thirds, he had for many years practised an external operation. He had done about 27 of these operations. A curved incision was made from the symphysis menti to the angle of the jaw, similar to that used in the classical operation for ligature of the lingual artery, and the flap containing platysma turned back. The entire submaxillary region was then cleared, the lingual and facial arteries being early identified, ligated far back, and divided. The digastric was divided and the mylohyoid detached from the jaw, and the muscles running into the front of the tongue divided close to the jaw, so that the dissection could be carried right down to the mucosa of the floor of the mouth, which was preserved intact. The buccal part of the operation consisted of the usual splitting of the tongue in the middle line. The mucosa was incised in the floor of the mouth from outside, and the tongue drawn out through the submaxillary wound and divided as far back as necessary, so that the affected portion of the tongue was removed in one piece with the whole of the submaxillary tissues. A sponge held in the wound prevented blood from running into the larynx during the final division. The operation was almost bloodless. The wound left was partly drawn together by two catgut sutures and a drainage-tube left in the middle of the wound and brought out through a separate incision one inch lower. Mr. Berry did not find intratracheal anæsthesia or preliminary laryngotomy necessary, and he had never had trouble from blood entering the larynx. Illustrations and drawings of the operation were shown, as well as specimens removed at operation.

Treatment by Diathermy.

Mr. W. H. CLAYTON-GREENE said that from the American statistics one fact emerged—if carcinomatous glands were present very few cases lived for three years. Upon all other points he agreed with Mr. Berry that statistics were useless unless the nature and position of the growth were stated. His own results had been so poor that he took to diathermy for the removal of intrabuccal carcinomata. For diathermy he claimed these advantages: (1) It was possible by this means alone to destroy the tongue right back to the epiglottis by an operation through the mouth; (2) there was no danger of the implantation of cancer cells in the operation wound. As a disadvantage it was stated, and rightly, that diathermy produced a septic slough, but the slough only became septic after an interval during which the lymphatics had become sealed off. He had only had one serious case of sepsis among 60 operations by diathermy within the mouth. As regards treatment, there were in America two schools—that of Crile, who advocated a bilateral "block dissection" of the neck with removal of the tongue later, and that of Quick, who maintained that no operation was of any avail. While not subscribing altogether to the latter view, he agreed that the results of surgical treatment, even in the Mayo Clinic, were most depressing. The operation he now performed resembled in some ways that described by Mr. Berry. Through an external excision, he made a clean sweep of the submaxillary region, and tied the facial and lingual arteries or the external carotid. The tongue was then removed by diathermy. He had now abandoned the "block dissection" since he had noticed that in many cases it appeared to favour recurrence in the neck, and that the results of this large operation were worse than those of the more limited ones. The same had been noted by others with regard to operation for cancer in other places, notably in the breast. He regarded the glands as constituting nature's barrier to the disease, and thought that in future more attention would be devoted to the extensive removal of the primary growth.

Treatment by Radium.

Mr. A. E. HAYWARD PINCH described his experiences of the treatment of cancer of the tongue at the Radium Institute. Of about 600 such cases, quite 580 were inoperable when first seen, and 300 could only be described as appalling. While radium could do something to help these people, it could not be claimed to have effected a single cure at the Radium Institute, although he did know of one case apparently cured by radium. This was the case of a physician in the West of England, who refused operation for a small growth of the tip of the tongue, confidently diagnosed by two surgeons as carcinomatous. He had treated himself by the application to the growth of a small tube containing 10 mg. of radium for one hour daily for three months. Many methods

of using radium had been devised, but Mr. Pinch's usual practice now was to use several tubes buried in the growth for six hours. On the rare occasions on which he saw operable cases he invariably passed them on to a surgeon, and, in his opinion, there was very little difference between the results of excision by the knife and by diathermy.

The Need for Radical Measures.

Mr. G. GORDON-TAYLOR agreed that the results of operation for cancer of the tongue were appalling. It had been said that the surgery of cancer was the surgery of the lymphatics, but it was not sufficiently realised that the lymphatics of the living subject differed from those described by anatomists, who obtained their information by the injection of the lymphatics in the dead subject. He had been driven by his previous results to perform more and more radical operations for cancer of the tongue and now performed a bilateral "block dissection" followed at a later period by the removal of the tongue by diathermy. He considered that this operation, which he had only been practising for a few years, already showed better results than those of the more limited operations he had formerly performed. For, of the cases he had operated on before 1914 all but one had recurrence within 12 months, whereas the larger operation had already enabled several patients to survive for three years. He did not hesitate to remove portions of the jaw if it were involved, and the operation he performed not infrequently resulted temporarily in considerable œdema of the face, which he regarded in the same light as the œdema of the arm following operation for cancer of the breast as showing a satisfactory removal of the lymphatics.

Mr. A. EDMUNDS inquired whether it was not generally observed that cancer of the tongue was much less prevalent amongst the well-to-do classes whose mouths were carefully tended. He also pointed out that second attacks of cancer in the tongue occasionally occurred, and gave one instance. As regards the preliminary treatment of the mouth, he suggested that it was preferable to have the teeth cleaned up rather than extracted, for extraction often left troublesome sepsis in the sockets. Nothing had done more to improve the operative treatment than the introduction of intratracheal anæsthesia, which he now invariably employed. When it was impossible to pass a tube at the beginning of the operation it could still be passed at a later period, when it was most useful. Although he feared that when extensive glandular involvement was present operation was almost hopeless, he still performed an extensive operation in the neck, and removed the tongue about ten days later. He did not ligature the lingual artery at the first operation. Good access to the tongue was imperative, and to obtain this he did not hesitate to split the cheek or to divide the jaw when necessary. It was his practice to sacrifice as little mucosa as possible, and to suture the edges of the wound in the mouth, where he obtained primary union owing to the frequent use of chloramine-T mouth washes.

Mr. H. S. CLOGG pointed out that recurrence after operation for cancer of the tongue was only rarely in the mouth. He had therefore given a trial to "block dissection," but without any improvement in his results, for recurrence took place in the neck under the upper part of the sterno-mastoid muscle in the region of the apex of the mastoid process and the posterior belly of the digastric. He now made a special attack upon this area by dividing the sterno-mastoid close to its upper attachment, although he could not yet claim any improvement in results from this procedure. He now regarded the outlook as hopeless, and the cases inoperable if the glands were adherent to muscle or fasciæ, or if they were cystic.

Mr. CECIL ROWNTREE said that the incidence of this disease was undoubtedly much less in the wealthy classes than in hospital patients. He agreed that fresh tumours occasionally occurred, and he instanced a case in which he had upon three occasions performed a local excision of an early cancer from the tongue of one patient. His experience of this disease led him to regard such cases as suitable only for a palliative operation unless they were very early. When the disease was well established he was content with the removal of as much tissue as possible near the mouth in order to prevent recurrence within that cavity. Only when the case was very early did he perform an elaborate operation involving an extensive dissection of the neck. In the employment of radium for the primary growth, he considered it important to bring the emanations into the closest possible contact with the growth, and he had recently induced a patient to keep four "needles" in the growth for 24 hours.

Mr. W. G. SPENCER pleaded for earlier recognition of the disease by the public and the general practitioner, and pointed out that the patient's resistance to squamous-celled carcinoma was very variable, and had a greater influence on the results of operation than the type of operation performed. While he agreed that the results were on the whole depressing, he stated that several of Butlin's cases were still alive. He thought that the division of the mylohyoid advocated by Mr. Berry was unnecessary and led to considerable discomfort from the dribbling of saliva. He performed a modified Kocher dissection with special attention to the three angles of the wound.

Dr. A. LAPTHORN SMITH believed that with proper attention to the teeth of the hospital classes cancer of the tongue would become a rare disease.

Reply.

Mr. BERRY, in reply, said he could not understand why a dissection of the glands should be performed before a removal of the primary growth, and he inquired what happened under these circumstances to disseminated cancer cells during the interval between the two operations. He did not know what his results had been, although the fact that he rarely saw patients after operation led him to suppose that the results were bad compared with those of cancer in other situations. His most successful result had been in the case of a medical student in whom a small growth had been present for six weeks, and who exhibited no secondary glands.

CARDIFF MEDICAL SOCIETY.

A MEETING of this Society was held on Feb. 13th, Prof. E. J. MACLEAN, the President, being in the chair.

Dr. IVOR J. DAVIES read a paper on

Subacute Infective Endocarditis,

based upon a report of eight cases. The term was applied to cases of old endocarditis with an added subacute infective process of streptococcal origin. There had been an apparent increase in the disease recently. Clinical data were submitted in support of Poynton's view that no hard-and-fast line could be drawn between simple endocarditis and infective endocarditis. In four cases an arthritis of the larger joints was present, indistinguishable from that of subacute rheumatism. In one of these cases the post-mortem appearances resembled those of simple endocarditis, except that there was an extension of the morbid process to the wall of the left auricle. The clinical picture was described as, briefly, that of a case of V.D.H., usually aortic in the case of ex-Service men, with certain general signs and symptoms added to those of the mechanical cardiac disability. These were grouped under two heads: (1) toxic, (2) embolic. Enlargement of the spleen was perhaps the most valuable early sign. Clubbing of the fingers, too, occurred early in the disease. The embolic signs shown by the eight cases included petechiæ, a papular and nodular eruption, mycotic aneurysms of the femoral and brachial arteries, intermittent albuminuria, and hæmaturia. The duration varied from three months to two years and was 12 months on an average.

Vaccine and serum therapy, as in other forms of septicæmia, appeared to be the most promising line of treatment. The termination was from heart failure, except in two cases in which acute uræmia was the final event. Blood culture might show the streptococcus, and if negative from venupuncture, then a little blood could be withdrawn from the spleen for cultural examination.

Dr. R. PRICHARD stated that in most of his cases of subacute infective endocarditis there had been an antecedent history of rheumatism. He was of opinion that an infection of intestinal origin played an important part in the subsequent development of the condition; he had frequently noted the presence of tympanitis and general atony of the bowel, and he had succeeded in obtaining temporary improvement of the cardiac state following the administration of intestinal antiseptics. In one case, which he quoted, the ætiological factor (pyorrhœa alveolaris) was strikingly demonstrated; removal of the teeth was followed by relief of the valvular symptoms, and the man's condition so improved that at the end of six months he was sent back fit for light duty.

The PRESIDENT asked if the condition occurred more frequently in one sex than the other, and if auricular fibrillation had been present in any of the cases.

Dr. H. A. HAIG'S contribution to the discussion was based on the post-mortem examination of 30 cases seen at a pensions hospital during 1920–21. The majority showed a streptococcal infection of either the aortic valve or the aortic and mitral valves together. In a few cases *S. hæmolyticus* had been proved by blood-culture to be present during life. Regarding antecedent conditions in the heart valves, especially the aortic, the question of a specific history was raised. Throughout the series of cases the kidneys were the seat of lesions referable, he considered, to the slowly-acting toxæmia directly connected with the infective process. There was a possibility, he agreed, that some of the changes were due to an antecedent attack of trench nephritis; on the other hand, the evidence of recent mischief pointed directly to the involvement of the kidneys in the general process. He mentioned the further possibility of war wounds having acted as portals of entry for the systemic streptococcal invasion.

Dr. HERBERT EVANS related a case of subacute infective endocarditis where he had been able, also, to trace the secondary involvement of the aortic valve from the mitral. He quoted Cotton to the effect that the earliest manifestations of petechiæ were to be noted under the finger-nails and in the sub-palpebral onjunctiva.

Dr. DAVIES, in reply, agreed with Dr. Prichard with regard to the value of treating any coexisting alimentary intoxication. The condition was equally common in both sexes, and auricular fibrillation was an infrequent event. He disagreed with Dr. Haig regarding the renal lesions, being of opinion that diffuse nephritis occurred in acute infective endocarditis rather than in the subacute variety. There was no reason for believing that war wounds played any prominent part in the ætiology of the latter process.

A Case for Diagnosis.

Dr. H. SHEASBY showed a case for diagnosis of a boy, 8½ years old, with a large swelling in the right thigh, which first appeared at the age of 2½ years on the outer surface of the middle third of the thigh and had since got gradually bigger. There was slight pain when the leg was fully flexed. For three months it had been treated as a tuberculous lesion, but aspiration was negative and a skiagram showed no involvement of the femur.—The general consensus of opinion of the members present was that the condition was due to the presence of a lipoma underlying the quadriceps extensor.

The Bactericidal Action of Tears.

Mr. J. W. TUDOR THOMAS gave a demonstration, illustrated by cultures, of the bactericidal action of tears. Basing his work on the technique of Fleming, with various modifications, he showed that both fresh and boiled tears killed young cultures of *Sarcina flava* in dilutions of 1 : 1000. He further showed that heating tears to dryness and redissolving the residue had no effect on their bactericidal properties. Undiluted tears killed *Staphylococcus albus* and inhibited its growth in dilutions of 1 : 40. No bactericidal action was noted in the case of *Bacillus coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Bacillus pyocyaneus*. It was suggested that in estimating the sterility or otherwise of the conjunctiva the material obtained should be diluted appropriately in order to neutralise its bactericidal action; the latter would appear to be either organic in nature or closely bound up with the albumin molecule in the tears. It was improbable that it was in the nature of an enzyme, since its action remained after boiling.

MIDLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at the Royal Infirmary, Leicester, on Feb. 13th, Dr. C. E. PURSLOW, the President, being in the chair.

Exhibition of Cases and Specimens.

Dr. H. T. HICKS (Derby) showed microphotographs from a case of endometrioma of the ovary. The patient, a single woman of 34, gave a history of three years' severe dysmenorrhœa and menorrhagia. A fixed tender mass was palpable in the pouch of Douglas, and the uterus was enlarged and hard. The left ovary was found fixed in the pouch by dense adhesions, and the right ovary similarly adherent to the broad ligament, whilst a small tumour enlarged the fundus uteri. Both ovaries contained multiple "tarry" cysts. The microphotographs produced showed numerous glandular spaces in the ovarian stroma lined by cylindrical epithelium. Dr. Hicks discussed the theories of the pathology and ætiology of these cysts, and considered that the most likely explanation was endometrial metastases, though the cause of the migration of the endometrium remained obscure.

Dr. T. C. CLARE (Leicester) reported three cases of adenomyoma of the recto-vaginal septum. 1. A hard, round mass projecting into the rectum without involvement of the mucous membrane, associated with severe dysmenorrhœa and constipation. Uterus enlarged by fibroids. Pan-hysterectomy was performed. Sections of the tumour from the recto-vaginal septum showed (1) gland acini lined by a single layer of cells resembling uterine cells; (2) stroma, having the appearance in parts of fibromyoma. 2. A small, hard tumour felt in the recto-vaginal septum, and projecting slightly into the posterior fornix. There was long-standing dysmenorrhœa. The tumour—removed by incision into posterior fornix—showed gland acini and fibromyomatous stroma. 3. Symptoms of severe dysmenorrhœa and menorrhagia having been shown, a small tumour was felt behind the cervix, and was removed through a vaginal incision. The tumour contained a single large cyst lined by flattened epithelium, and embedded in a fibromyomatous stroma.

Dr. C. D. LOCHRANE (Derby) reported: 1. A case of adenomyoma of the recto-vaginal septum, showing decidual reaction during normal pregnancy. The patient complained of feeling something obstructing the rectum during defæcation. A multi-lobulated tumour was felt in the recto-vaginal septum, not palpably connected with the uterus, and encroaching on the lumen of the bowel. 2. A case of adenomyoma of the uterus in pregnancy, showing decidual reaction. 3. During Cæsarean section in a primipara of 42, a tumour, the size of a billiard ball, was found in the posterior wall of the uterus. Hysterectomy was performed. No symptoms except dysmenorrhœa had been manifest. These cases were illustrated by slides. Dr. Lochrane discussed the ætiology of these tumours.

Dr. LOCHRANE also showed a specimen of carcinoma of the vulva following leucoplakia. When the case

was first seen there was no evidence of malignant change, but when seen after X ray treatment there was an obvious epithelioma with glandular involvement.

Mr. FURNEAUX JORDAN commented on the disappointing results of X ray in the treatment of leucoplakia and carcinoma of the vulva.

Mr. CECIL MARRIOTT (Leicester) opened a discussion on the

Treatment of Full-term Ectopic Gestation.

He referred to a meeting of the Section of Obstetrics and Gynæcology, Royal Society of Medicine, held in 1919, when the late Mr. Gordon Lœy produced notes of 100 collected cases, from which he showed that the maternal mortality was high in cases of early operation, whilst there was risk of infection of the sac if left for long after full term. The mortality amongst babies delivered at the time of false labour was low, and many of these babies (50 per cent.) presented various degrees of deformity. Treatment resolved itself into early or late operation. In early operation the maternal risk from hæmorrhage was very great, and though, in suitable cases, after primary ligature of all big vessels the sac and placenta might be removed without excessive bleeding, it was probably wiser to marsupialise the sac and leave the placenta to natural absorption. In cases where no effort was made to save the child operation should be delayed for at least three months, by which time bleeding would be greatly lessened and the operative risks small. Mr. Marriott reported the details of a case operated on by him on these lines three months after spurious labour.

The PRESIDENT and Mr. JORDAN took part in the discussion, referring to one of the earliest cases successfully operated on at term—by the late Prof. Taylor. Mr. Jordan also reported two cases; one operated on two years after false labour, in which the sac contained the fœtal bones and some dark brown fluid, and the other seen two months after term, which presented no operative difficulties.

Dr. HICKS mentioned a recent case in which he delivered a living but deformed child. Both walls of the uterus and the placenta were encountered and incised before the sac was opened. There was brisk hæmorrhage, dealt with by marsupialisation of the sac and plugging. In view of the formidable nature of the operation at term Dr. Hicks strongly favoured late operation.

Dr. CLARE mentioned a case operated on two weeks after labour, in which severe hæmorrhage was encountered, though no attempt was made to separate the sac or placenta. He considered a considerably longer interval necessary before operation.

Dr. LOCHRANE reported a case operated on 18 months after labour. The placental attachment was in the Fallopian tube, and removal presented no difficulties.

ABERDEEN ROYAL INFIRMARY.—The 138th annual report states that during the year 1922 the average number of occupied beds was 269, being 20 more than in the previous year, while the increase in the number of in-patients was 134, there being 3936 admissions. There were 14,401 out-patients treated, in all 18,337 patients for the year; 2341 operations on in-patients were performed, and at the end of December the waiting list numbered 269, exactly the number of beds occupied for the year. The infirmary has now the benefit of the radium lent by the Medical Research Council, and Dr. John Cruickshank, research lecturer in malignant diseases, Aberdeen University, has been appointed director of radium therapy and research, with Dr. Douglas W. Berry as his assistant. The work will be carried on under the supervision of a local radium committee, consisting of members of the honorary medical staff of the infirmary. The average cost per occupied bed was £104 11*s.* 7*d.*, compared with £124 5*s.* 2*d.* in 1921, and the average cost of each in-patient treated was £7 2*s.* 11*d.*, against £8 2*s.* 9*d.* in 1921. There was an extraordinary income of £2396, which reduced the deficit for the year to £45, as against £741 in 1921. During the year 434 patients were treated in the convalescent hospital.

Reviews and Notices of Books.

ORIGIN AND EVOLUTION OF THE HUMAN DENTITION. By WM. K. GREGORY, Ph.D., Associate Professor of Vertebrate Palæontology, Columbia University: Curator of the Department of Comparative Anatomy, American Museum of Natural History. Baltimore: Williams and Wilkins Company. 1922. Pp. 548.

IT is some 40 years since Prof. E. D. Cope advanced the view that derived the higher types of molar teeth from a tritubercular ancestry. Even if he had done nothing else, Prof. Gregory would have accomplished a good thing in putting clearly before the non-specialist in odontology the essential difference between this view and the Cope-Osborn hypothesis, which attempted to derive trituberculate from triconodont dentition. The repeated attacks on this hypothesis, and its apparent failure to hold its ground, do not in any way weaken or affect the great value of the first theory: it is well that the two be clearly separated. The Purbeck spalacotheres, foundation-stones for the Cope-Osborn "rotation" hypothesis, seemed to lend themselves more easily to explanation on this view than on others. It came into line with more primitive triconodont dentition. Enormous collections of material have been accumulating for many years in the American museums, and of these Prof. Gregory takes toll to some purpose. On this question of the derivation of the tritubercular type, for example, he is able to show the coexistence of this true type with true triconodont patterns in the Stonesfield slate, thus throwing the question back much further, and removing the spalacotheres from the discussion. Yet the path of progress that led to the earliest tritubercular tooth is still unknown, for *Karoomys browni* seems but a poor guide to it, and we doubt whether the spalacotheres may not represent a persistent primitive stage in their dentition, the more primitive animals having derived their tritubercuły on parallel lines, while the evidence for the process is at present unknown.

But the author of this book has done much more than clear away the confusion surrounding the theories: he has given us an authoritative work on a subject which might easily have been wearying, but which he has invested with a compelling fascination. He goes to palæontology for evolutionary evidence, and avoids in this way many of the snares set for the feet of those who labour among modern forms of life. The volume ranges from the primitive Silurian and Devonian sharks to the highest points of the evolutionary tree. Prof. Gregory thinks it probable that the paraconid, metaconid, and entoconid arose in their positions on the slope of the protoconid, and not from any circumduction of triconodont cusps, and looks on the Cope-Osborn hypothesis as not supported by the earliest known trituberculates. He is, however, as is well known, an ardent supporter of Cope's tritubercular theory. He considers the new-world platyrrhines as quite removed from the evolutionary line of the old-world series, and concludes that the mid-tertiary anthropoids lie in or near the line of human ascent—a conclusion with which, we imagine, some will find it hard to agree. Finally, he advances the opinion that man is to be regarded as an offshoot, in late tertiary times, of the Dryopithecus-Sivapithecus group, or some closely related genus.

Many biologists lay less stress than their predecessors on details of dentition, but we have no hesitation in saying that, whatever their views on the matter, this book should be in their libraries. It is, and will be for many years, a standard work on its subject and a necessity for every student of odontology. It is profusely illustrated, well printed, and produced.

DUFF HOUSE PAPERS.

Vol. I. Edited by EDMUND I. SPRIGGS, M.D., F.R.C.P., Physician to Duff House. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 387. 30*s*.

Dr. E. I. Spriggs and his assistants take a legitimate pride in their hospital, and express that sentiment here. In addition to the physicians and ex-physicians of the staff, the contributors include surgeons who have worked with them, chemists and radiographers, the diet Sister, and the head gardener to the establishment. But it would be conveying a false impression to say that the work is merely a handbook showing the nature of the hospital, for the collection of papers, reprinted in the main from leading medical journals, contains contributions to our knowledge of alimentary disease as important as any that have appeared during the last ten years. The monographs from the editor and Mr. O. A. Marxer dealing with the radiography of the vermiform appendix, with the failures of gastro-enterostomy, and with diverticulitis deserve wider attention than they could obtain in casual publications, while that by Dr. Dennison Pickering on the blood-sugar in diabetes, Dr. Philip Conran's account of meat diet in sprue, and the editor's essay on sulphæmoglobinæmia contain data of the greatest value. A well illustrated account of the radiographic routine at Duff House, written by Mr. Marxer, may be taken as an epitome of modern special practice.

The inclusion in the volume of the pamphlet entitled "The Patient's Manual of Diabetes" is puzzling, for there can hardly be a public to whom this and the rest of the book can make an equal appeal.

RÖNTGENTHERAPEUTISCHES HILFSBUCH.

Second edition. By Dr. ROBERT LENK, Assistent am Zentralröntgenlabatorium des allgemeinen Krankenhauses in Wien. Berlin: Julius Springer. 1922. Pp. 72. 2*s*.

THIS small book has been written in order to help specialists in other branches of medicine and general practitioners to obtain a grasp of the principles and the main points in X ray treatment. It is divided into two portions; the first part touches lightly on the general problems of ray treatment, while the second deals with a number of diseases in alphabetical order. Practically no reference is made to the technical side of X ray apparatus.

The general section deals with the usual subjects such as the action of X rays on tissues, the prognosis of diseases, the duration of treatment, the course of diseases under the influence of rays, the immediate effects of X rays, the X ray reaction, and late changes following irradiation. In this last respect the late necroses following from months to a year after treatment by irradiation are mentioned. These have fairly often been noted on the continent, particularly following the massive doses of deep therapy; attention is also drawn to laryngitis following X ray treatment of tumours of the neck, though no mention is made of the still more serious condition which has occurred in Germany—namely, necrosis of the larynx. Accessory treatments and contra-indications are largely reserved for the special section of the volume. The last section of the first half of the book explains the author's method of writing a formula for treatment in different cases. He draws attention to the difficulty of providing a generally applicable formula owing to the variations in treatment necessary in different cases, the knowledge of which can come only from experience.

The second part of the book deals with a rather bewildering variety of diseases, showing the Mid-European tendency to claim a very wide sphere of usefulness for X rays. The treatment of skin diseases as a whole calls for no comment, but the claim that relief from pain and improvement follow treatment in angina pectoris, asthma, gall-bladder pain, badly working gastro-enterostomies, and osteomalacia should be received with some reserve. In the passage on the X ray treatment of hypertrichosis the note "Kontra-indikationen—Keine" would permit the unskilled to set out on the treatment of this condition with far too light a heart. Lipomata are reported to shrink under ray treatment, while chilblains are said to be cured by it, but no mention of relapse or failure to respond is made. In the treatment of malignant tumours the massive dosage to obtain the "knock-out blow" is not apparently used, but a preliminary "try-out" dose is given, followed by a prolonged course of treatment. Combined radium and X ray treatment is recommended, but no help is given in respect to the exact combination of dosage. Radium is recommended for the treatment of cancer in the various orifices of the body.

The book is a useful aid to X ray treatment, but it is doubtful if many English practitioners would feel adequately rewarded for the trouble taken in reading it through.

DISEASES OF THE SKIN.

Ninth edition. By HENRY W. STELWAGON, M.D., Ph.D., late Professor of Dermatology, Jefferson Medical College. With the assistance of HENRY K. GASKILL, M.D., Dermatologist to the Philadelphia General Hospital. London and Philadelphia: W. B. Saunders Company. Pp. 1313. 50*s*.

Prof. Stelwagon's death occurred while the ninth edition of his text-book was in course of preparation, and Dr. Gaskill has completed the task of revision, making use as far as possible of the notes and abstracts left by the author. The book is so well known to dermatologists that a detailed exposition of its merits is hardly necessary. Each edition through which it has passed has been remarkable, not only for the full and carefully compiled accounts of the ætiology, symptomatology, and treatment of all the recognised diseases of the skin, but still more for the wealth of references, with comments, to original articles. At the same time it is not merely a compilation of other people's views and writings, but contains the author's personal experience, and several valuable suggestions in the sections on treatment. It will remain, however, essentially a work of reference for professed dermatologists, since it is far too bulky and detailed for the average practitioner or the student of general medicine. As a single volume text-book of dermatology it holds a notable position, and is a monument to the patient industry of its author. It is to be hoped that Dr. Gaskill will be able to make himself responsible for the preparation of future editions.

DISEASES OF THE HEART.

Second edition. By JOHN COWAN, D.Sc., M.D., F.R.F.P.S., Physician to the Royal Infirmary, Glasgow; and W. T. RITCHIE, O.B.E., M.D., F.R.C.P.E., F.R.S.E., Physician to the Royal Infirmary, Edinburgh. With a chapter on "The Ocular Manifestations of Arterial Disease," by ARTHUR J. BALLANTYNE, M.D., F.R.F.P.S. London: Edward Arnold and Co. 1922. Pp. 605. 30*s*.

IN recent years much of the progress in our knowledge of the cardiac mechanism has been the outcome of work along highly specialised lines. The developments of electrocardiography, even the simpler forms of graphic records obtained by means of the polygraph, and such closely allied subjects as the reaction of the blood in relation to dyspnœa, are so different from the teaching of 20 years ago as to prove somewhat bewildering to those who have neither the time nor the opportunity for keeping touch with modern physiology. Consequently, in the minds of practitioners and even of general physicians there has arisen a tendency to divide cardiology into two compartments, the old and the new, with a not unnatural danger of underrating the importance of either the one or the other. Writers have been confronted by the same difficulty, and in attempting to embrace the whole subject of cardiology

have generally been content to make their pudding from the old recipe of their predecessors, and to serve up the newer work separately in the form of a sauce to be taken or left according to taste.

For this reason perhaps more than for any other Drs. Cowan and Ritchie are to be congratulated on having produced an extremely palatable dish in which sauce and pudding have been intimately blended to their mutual advantage. Their book is not merely a comprehensive exposition of the old and the new cardiology: it is a work in which the two have been welded into one, the new facts having been so assimilated as to become an integral part of the older teaching. The introductory chapters are followed by an account of disorders of the five primary cardiac functions. Next come auricular flutter, fibrillation, and nodal rhythm. Acute endocarditis, chronic valvular disease, heart failure, and angina are dealt with in detail. D.A.H., pericarditis, and congenital lesions complete the diseases of the heart, and the remaining chapters are devoted to diseases of the arteries, including aneurysm, together with a description by Dr. A. J. Ballantyne of the ocular manifestations of arterial disease. The book is well illustrated throughout by a large collection of drawings, microphotographs, electrocardiograms and radiograms. The present conception of "D.A.H." and functional cardiac murmurs receives critical consideration. These subjects have recently attracted much attention owing to the exceptional opportunities afforded by the war for investigating large numbers of cases, and our ideas concerning the significance of certain symptoms and physical signs have become profoundly modified.

There are one or two aspects of cardiology which might with advantage be dealt with more fully in a future edition—for example, the work of Eggleston and others in America on the treatment of auricular fibrillation with massive doses of digitalis; the diagnosis of the common subacute type of bacterial endocarditis; and the differential diagnosis of true from pseudo angina pectoris. All of these are subjects in which the practitioner looks for guidance. Especially attractive are the chapters dealing with the various derangements of cardiac function. The account of these disorders is admirably clear both from the point of view of diagnosis and of prognosis. The practical problems of treatment are fully considered and the importance of prolonged rest in acute endocarditis is duly emphasised. A comprehensive work such as this must necessarily contain a large number of references to original papers and publications. The authors have, however, succeeded in giving to it a strongly personal character by basing their arguments as far as possible on illustrative cases drawn from their own experience.

The lucid and practical character of the book will appeal to the student and practitioner, while its completeness will render it of real value to those who are especially interested in diseases of the heart.

INJURY, RECOVERY, AND DEATH.

In Relation to Conductivity and Permeability. By W. J. V. OSTERHOUT, Ph.D. London and Philadelphia: J. B. Lippincott Company. 1922. With 96 text-figures. Pp. 259. 10*s.* 6*d.*

Dr. Osterhout, professor of botany in Harvard University and one of the editors of the *Journal of General Physiology*, is, along with Dr. J. Loeb and Prof. T. H. Morgan, responsible for the "Monographs on Experimental Biology" of which this volume is one. The general preface to the series says, "Experimental Biology and General Physiology are one and the same science, by method as well as by contents, since both aim at explaining life from the physico-chemical constitution of living matter"; and the individual preface avows that "this volume endeavours to treat certain aspects of biology according to the spirit and methods of the exact sciences." From which quotations the reader will know what to expect. The author found some time ago that, by cutting discs out of the fleshy leaves of the seaweed *Laminaria* and putting them together into a column of which he could fairly easily measure the electrical resistance, he was provided with a technique which would enable him to make a great number of "exact" measurements under an endless variety of conditions. When this representation of an organism is treated with poisonous agents the conductivity increases, sometimes after a preliminary fall, roughly in proportion to the degree of injury which it is reasonable to assume the particular poison would be likely to inflict on it. If the injury is slight and the poisonous agent then removed, conductivity partly or wholly returns to its normal level. If the poisonous solution with which the pieces of leaf are treated is strong enough, conductivity progressively increases and the tissue passes beyond the point where recovery is possible and dies. The book is an account of Prof. Osterhout's researches along this and similar lines, and appears to be a summary of the 53 papers by him which are mentioned in the bibliography. It is in no sense a general discussion of what is known and what has been thought and imagined on the topics of injury, recovery, and death.

With the example of muscle-nerve physiology before us, it would be idle to criticise the author's outlook on what he has decided to call "biology" or his method of approach. "Wiring frogs on to machinery" was jeered at enough in this country until we realised that the instinct of du Bois Reymond, Sanderson, and the other great minds who engaged in that occupation was a sound one, and that the intensive study of the conditions and mode of action of the highly specialised excitable tissues has brought us to general conclusions of the first order not only in general biology (*sensu* Anglico), but actually in practical medicine. Prof. Osterhout's flair may be as good: we hope so.

SYPHILIS.

Syphilis of the Innocent. A Study of the Social Effects of Syphilis on the Family and the Community. By HARRY C. SOLOMON, B.S., M.D., and MAIDA HERMAN SOLOMON, A.B., B.S. Washington: United States Interdepartmental Social Hygiene Board. 1922. Pp. 240.

THIS book is the result of investigations made by aid of a grant of funds from the U.S. Interdepartmental Social Hygiene Board, and is an attempt to show syphilis in its social aspects. The scheme of the book may be gathered from the section headings: The Individual, The Mate, The Child, The Family, The Community. In Chapter I. two errors of fact have appeared. The discovery of the treponema is dated 1906, and the Wassermann reaction 1909, instead of 1905 and 1906 respectively. In the chapter on the child much has been written in regard to congenital and antenatal infection, but little new light has been shed on old problems. In the chapter on the family we find much interesting matter on the laws of the United States as to examination and certification of people before marriage. The practice evidently is much more extensive in this respect than in this country. The book will be of interest mainly to the lay reader, and contains much valuable propagandist matter.

Syphilis and Syphilis-like Diseases of the Mouth. For Doctors, Dentists, and Students. Third enlarged edition. By Dr. FERD. ZINSSER. Berlin and Vienna: Urban and Schwarzenberg. 1922. With 71 illustrations, of which 54 are coloured. Pp. 153. 12*s.* 6*d.*

THIS book serves an excellent purpose—it brings together a mass of information about syphilis and similar affections of the mouth, which those interested would have to plough through much literature, medical, surgical, and dental, to find. Its greatest feature is its wealth of beautiful illustrations, and the text is concise. This profuse illustration is necessary as it would be difficult for all those in need of such a

book to see the cases in all the different clinics where they would present themselves. This third edition is enlarged and revised, and shows some new plates, especially of foot-and-mouth disease. It is an excellent work, and should be perused by every dentist and doctor for his own safety and that of others.

PHYSIOLOGIE NORMALE ET PATHOLOGIQUE DE LA MICTION.

By Dr. GEORGES LEMOINE. Bruxelles: Imprimerie Médicale et Scientifique. 1922. Pp. 102.

THIS monograph comes from a clinician who, in order to understand some of the various problems which confronted him in his work, found himself impelled to make a careful study of the anatomy and physiology of the whole urinary tract and especially of its innervation. He has as a result produced a somewhat curious treatise in that two-thirds of the contents are occupied with a résumé of the anatomy and physiology of the parts concerned and rather less than one-third with the clinical phenomena. But the reader can have no quarrel with this arrangement; it is, in fact, extremely useful to find put together in small compass a complete account of the more recent researches in a subject difficult to understand, and Dr. Lemoine deserves the thanks of clinicians for thus making them readily available.

When he has thus laid the foundation for his clinical studies he is able to present these in a few pages which can be easily followed. He deals in successive sections with incontinence, spasm of the urethra, and retention of urine. He has not perhaps much that is new to say in this field, but he is able to present his facts in a logical fashion. For example, he can give a classification of the varied types of incontinence based on physiological conception. In the actual diagnosis of what he styles "essential incontinence" he appears to attribute considerable importance to measurements of the pressure of fluid contained within the bladder, which he ascertains by the employment of a manometer. To us this appears to be the least convincing part of his work.

The monograph does not claim to present much original work, but it gives a clear and concise account of the present state of our knowledge of the subject of the physiology and pathology of micturition.

JOURNALS.

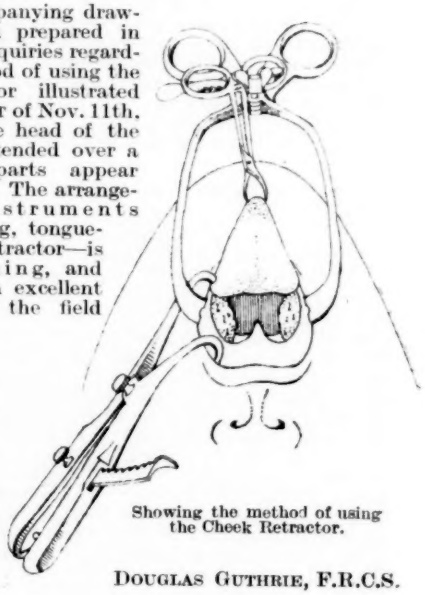
JOURNAL OF INDUSTRIAL HYGIENE.—In the January issue Bishop Harman gives figures showing that out of 480 myopes 53 per cent. of those who were engaged as habitual close eye-workers broke down with visual defects, while of those who were not so engaged only 9·4 per cent. broke down. He found that the tendency to break down increased with the degree of myopia; thus whereas out of 71 close eye-workers whose myopia varied from 3–5 D., 24 sustained visual injury, out of 31 with myopia over 10 D., 24 suffered. He concludes that the risks associated with myopia are heavier if habitual close eye-work is followed, and that the liability to damage is so great that young persons affected with myopia should be prevented from embarking upon such work.—An article of considerable importance, by the late Sheridan Delépine, upon the effects of exposure to arsenic trichloride is completed; it is a good posthumous instance of the careful work of the lamented author. He shows how arsenic trichloride spilt on the skin led to death from acute arsenicism. Special methods of estimating arsenic present in the tissues are described, and the amount found both in workmen and animals exposed to fumes of arsenic trichloride is stated. Aqueous vapour was found to decompose arsenic trichloride, and water-seals are, therefore, suggested to protect vessels whence this poisonous chemical might escape.

In the February issue observations made under the direction of L. Hill upon the comf-thermometer are given; the instrument itself is first described; it is essentially a fresh-air gauge intended to give some measure of the feeling of comfort given by any atmosphere. The observers aimed at obtaining a relation between the comf- and kata-thermometer readings. Diagrams are given showing that in the main readings obtained with the two instruments do in fact vary together. The observers conclude that "the comf" is a reliable instrument for indicating whether the air conditions are satisfactory, so long as certain precautions are taken and the instrument is not used in a fast air-current.—A paper of some moment upon the pharmacology of the phenylene-diamines, dealt with by P. J. Hanzlik, is concluded in this number. The writer shows that these chemicals are used extensively in industry and art, and are definitely toxic. The different compounds in the group have a toxicity which varies according to their chemical composition. Certain of them may be absorbed through the unbroken skin; they may also cause dermatitis, or even burns. All these compounds stimulate the circulation and respiration, cause fall of body temperature, tremors, increased reflexes, convulsions, coma, and death. The action was studied step by step experimentally upon animals. Hanzlik considers asthma and respiratory troubles, suffered by workers in the fur-dye industry, to be due directly to the use of para-phenylenediamine; he suggests that workmen should be protected in industries where this chemical is used, and that it should be prohibited as a hair-dye or cosmetic. He holds that these compounds are of no value therapeutically.—This number contains another post-humous article from the pen of Sheridan Delépine, who reports upon two fatalities due to inhaling phosgene. He shows that phosgene does not act as a direct lethal agent, but as a powerful irritant of the air-passages, setting up exudation which obstructs the bronchials, acting in this way much as do nitrous fumes. Death results from plugging of the bronchioles, which prevents air reaching the alveoli. Careful particulars of post-mortem examinations are given.

New Inventions.

A CHEEK RETRACTOR FOR TONSIL OPERATIONS.

THE accompanying drawing has been prepared in response to inquiries regarding the method of using the cheek retractor illustrated in THE LANCET of Nov. 11th, 1922. As the head of the patient is extended over a pillow, the parts appear upside-down. The arrangement of instruments—Waugh's gag, tongue-clip, and retractor—is self-retaining, and secures an excellent exposure of the field of operation in the removal of tonsils by dissection under general anæsthesia. A tongue depressor may also be used, but is rarely required.



Showing the method of using the Cheek Retractor.

Edinburgh. DOUGLAS GUTHRIE, F.R.C.S.

THE LANCET.

LONDON: SATURDAY, MARCH 3, 1923.

THE PSYCHOLOGY OF PUNISHMENT.

A CRITICAL spirit in regard to social ideas and institutions has been increasingly active since the war, and, as much for this reason as through the influence of certain *causes célèbres*, a deep interest is now being taken by all men in the problems of crime and the attitude of society towards the criminal. Widespread dissatisfaction has been manifested in certain cases with the accepted methods of legal punishment, and we are not prepared to defend existing penal systems as models of intelligent conception or efficiency when applied to many modern conditions. But it is surprising to observe that, quite apart from any question of the inefficiency of particular methods of penal administration, there should be a considerable development of public scepticism regarding the very principle of punishment, and a growing disposition to impugn the value of any punitive or retributive element at all in the treatment of the criminal. This sceptical tendency might, perhaps, be looked for in the speculations of the mental pathologist whose special line of work makes him acquainted mainly with such cases of crime as are closely related to definite morbid conditions in the criminal; the observer who generalises from instances of this sort will naturally incline to extend to all criminals the impunity from punishment which is regularly accorded to the madman and the idiot. It is not, however, solely amongst alienists that this rejection of the punitive principle has become very vocal of late. In the most unlikely quarters, even in the ranks of the legal profession, doubts are freely expressed as to the justice and expediency of penal sanctions, and one of the most recent and thorough-going statements of the case against punishment comes from the pen of an American lawyer who has had long and varied experience in the criminal courts.

The views set out in Mr. CLARENCE DARROW'S book on Crime: its Cause and Treatment,[1] are lucidly presented. His main thesis is that, since criminal conduct, as, indeed, all conduct, is the inevitable consequence of antecedent conditions in the individual and in his environment, it is futile to attribute moral responsibility to the law-breaker, and that therefore the social reaction against crime should be dissociated from any feeling of reprobation, and should be purged of all punitive elements. On this view, the sane offender is in the same position, as regards responsibility, with the idiot and the madman, not because his anti-social behaviour implies any similar abnormality of organisation, but because the conduct of both sane and insane is governed by the same universal laws. Mr. DARROW is thus on firmer ground than the critics of punishment, who rest their case on those more extravagant doctrines of the Italian criminologists, so effectually refuted in the monumental work of the late Dr. CHARLES GORING. The weakness of Mr. DARROW'S argument is not so much in his initial position, as in the conclusions which he draws from his premises. Even if full assent be given to the determinist doctrine, it does not follow that punishment is unjust and illogical. To repudiate the metaphysical doctrine of free will, and to recognise that human conduct is governed by causation in the same way as other natural phenomena, does not by any means imply that there should be no social reaction against the criminal. This reaction is, itself, simply a procedure of self-defence, a response of the group to conduct which it conceives to be hurtful to its interest and safety; and an emotion of disgust and repulsion with regard to the offender is its natural accompaniment. The social reaction against crime may become morbid by deficiency as well as by excess. The feeling of moral indignation which is awakened by a particularly hideous crime is, in fact, an indication of a healthy state of public opinion, and the fear of awakening such a feeling in the group is, perhaps, even more potent as a deterrent from crime than is the anticipation of material punishment.

Apart from positive evidence of experience, the universal belief in the deterrent value of punishment is in itself in some sort a proof of its efficacy. In the determination of conduct a belief has the force of a reality, and when the average man feels, as he does feel, that legal punishment and the disgrace that attaches to it act as motives that deter him from crime, there is no reason to question their potency. Nor is this view in the least inconsistent with the admission of the legal irresponsibility of the insane. It is not because the acts of the insane are supposed to be more subject to the laws of causation than are the acts of the sane that civilised communities abstain from punishing madmen for their crimes. So far as this more lenient attitude has a rational basis, it is due in part to a recognition of the fact that mental disease abolishes or diminishes the power of reacting to the influences which tend to restrain sane persons from breaking the law, so that to punish the insane criminal is useless from the point of view of deterrence; and it arises in part from the feeling expressed in the old dictum that the madman is sufficiently punished by his madness. That is the explanation of much of the popular emotion which is aroused when borderland criminals escape punishment on dubious pleas of insanity; such offenders, prior to their criminal exploits, have not been liable to the legal disabilities that affect the sufferers from more definite disorder of mind. Society can and does deprive the lunatic of his liberty to guard against his dangerous proclivities; when his madness is recognised he is locked up without waiting until he has committed a criminal act. The borderland criminal, on the other hand, claims to enjoy at once the privileges of sanity and of insanity; he cannot be restrained until he has committed a grave crime, and when he has committed such a crime he cannot be punished.

The real difficulty which this question presents from the point of view of public sentiment and social security has not yet been adequately recognised by those who advocate a wider extension of the plea of insanity in criminal cases. The only way in which it can be met is, as the late Dr. CHARLES MERCIER suggested many years ago, by getting rid of the pedantic notion that there exists a clean-cut and definite line between sanity and insanity, and by admitting the principle of partial responsibility. This principle has not so far found very enthusiastic support either from jurists or from alienists, but it has to some extent been implicitly accepted by the law within recent years, notably in connexion with the criminal responsibility of the alcoholic. The decision that drunkenness may, in certain circumstances, reduce the gravity of an act from murder to manslaughter is a case in point. In other countries the

[1] Crime: its Cause and Treatment. By Clarence Darrow. London: George G. Harrap and Co., Ltd. 1922. Pp. 292. 10*s*. 6*d*.

principle of partial responsibility is also gaining ground, and it has, in fact, been fully adopted in the draft proposals for the revision of the Imperial Criminal Law in Germany.[2] The paragraph therein referring to the effect of mental disability on responsibility for crime is as follows:—

"(i.) An accused person is not responsible if at the time he committed the act he was incapable through disorder of consciousness, through mental disease or through weakness of mind, of appreciating the illegality of the act, or of determining his will in conformity with such appreciation.

(ii.) If such capacity was diminished at the time of the act through one of the causes enumerated, the punishment is to be mitigated."

The explanatory memorandum on the proposed law indicates that the mental disorders entailing diminution of responsibility are the same in nature as those which exclude responsibility, but are of lesser degree. It is contemplated that in cases of partial responsibility the offender shall be liable to such punishment as would attach to conviction for a minor degree of the same crime—if the crime, for instance, were murder, the punishment would be that prescribed for attempting or being an accessory to murder. Where judged necessary in the interests of public security, the offender, after completing his mitigated sentence of imprisonment in a penal institution, may be detained under asylum conditions. These proposals are obviously open to criticism on many points, but their affirmation of the principle of partial responsibility is at all events a constructive suggestion, and may well be commended to the notice of the various committees, legal and medical, who are at present engaged in considering the amendment of the English law on the plea of insanity in criminal cases.

THE PROSPECTS OF THE VOLUNTARY HOSPITALS.

THE Voluntary Hospitals Commission, it will be remembered, were appointed in 1921, by Sir ALFRED MOND, then Minister of Health, to be a Commission to administer a Government grant of £500,000 for the voluntary hospitals of Great Britain in accordance with certain terms. The £500,000 was the outcome of a Parliamentary vote, and the terms provided that the amount should be applied in special grants to voluntary hospitals to assist in meeting deficiency in income, but these payments were only to be made on conditions that were approved by the Treasury. Of these conditions the most important one was that, after the urgent cases had been dealt with, the disbursement of the balance of the grant should proceed pro rata against fresh money raised by the charity, or in sight. This condition has been adversely criticised, but, as it was implied in the Parliamentary vote and explicitly embodied in the terms of the appointment of the Voluntary Hospitals Commission, that Commission could only work in accordance with it.

The Commission has now presented an interim report from which we gather that the total amount distributed up to Dec. 31st, 1922, was £373,000, the grant being administered in two groups, one of £225,000 for hospitals in London, the other of £275,000 for the remaining institutions. The grants made already have prevented the closing of beds in many hospitals, and have enabled others to reopen wards that had been shut, and in this way much intolerable strain has been relieved over a large field. The grants have all been made in respect of deficits for maintenance accounts for the year 1921, and inspection of the accounts shows that the Treasury condition of disbursements—namely, that they should be made only where similar sums of fresh money have been raised from voluntary sources—has justified itself. The Commission have found that the condition has proved a valuable incentive to the hospitals to make special efforts, and these have in the aggregate resulted in the receipt by the charities of a larger sum-total than the grant administered by the Commission—in London alone, for example, a combined appeal organised by King Edward's Hospital Fund resulted in obtaining nearly £400,000. A most valuable part of the work of the Commission has been the establishment of Local Voluntary Hospital Committees for England, Wales, and Scotland, London being here excluded, inasmuch as the Council of King Edward's Hospital Fund acts as such a local committee for the metropolis. The duties of these Local Committees consist in collecting information as to district needs; in organising coöperation between institutions, which may thus be stimulated to the coördination of appeals or to the suitable transfer of patients; and in inquiring into the coöperative purchase of stores and the adoption of a uniform system of hospital accounts. The Committees are now in being in 42 provincial centres in England, 4 in Wales, 13 in Scotland, and as the personnel comprises representatives of the local authorities, the hospitals, the medical profession, and others directly nominated by the Commission, it will be seen that the work is being done with a full back-ground of knowledge. In some cases, we are told, these bodies have gone beyond the actual list of duties laid down, and have taken the initiative in raising new money from voluntary sources, and it is clear that there is one direction in which they can be especially useful—namely, in the organisation of systematic contributions both from employers and employees in areas where no plan of the sort at present exists. This is a departure of recent date, from which much of the expected success of the voluntary hospital system in the future will come.

Every one who reads the report—and it should be widely perused—will see that the Commission, bringing general and special experience to bear upon what has obviously been close investigation, have found the voluntary system to be full of life and with chances of permanent survival opening up before it. On the whole, hospital incomes have been well maintained, and the deficits in 1921 have proved to be less than was anticipated in Lord CAVE'S admirable report.[1] But the members of the Voluntary Hospitals Commission urge a wise caution against a too ready optimism. It can be seen that the margin between income and expenditure, though narrowing, is still wide, and it can be seen also that this has occurred at a time when anything like profuse expenditure has been impossible, but when the needs for it have in some places been very real. The demand for increased accommodation in many hospitals to meet long waiting lists cannot be met without the collection and distribution of very large sums, and unless the hospitality of the hospitals can be rendered both more extensive and more prompt the voluntary system must lie under criticism. The Commission make no recommendation as to the continuance of State assistance after the present grant is exhausted.

[2] See M. H. Göring, "Uber der neuen Entwarf zu einen deutschen Strafgesetzbuch," in Zeitschrift für die gesamte Neurologie und Psychiatrie, vol. lxx., 1921.

[1] Vide THE LANCET, June 18th, 1921, pp. 1311 and 1320.

THE SOCIABILITY OF ORGANISMS.

A GOOD many bacteriologists have noticed that a loopful of an ordinary culture may fail to start a successful growth if it is planted into a couple of litres of broth when transplantation will be achieved every time into a volume of five or ten cubic centimetres. In practice the difficulty is easily surmounted by using a larger inoculum and the phenomenon does not seem to have been subjected to any detailed analysis. It is possibly due to the presence in nutrient broth of a limited amount of some poisonous substance which is used up by a certain number of organisms; it may be due to large inocula containing more individuals of exceptional vigour and resistance than smaller doses; it may be due to bacteria failing to grow well if they are too widely separated from one another, with the implication that this loneliness is effective because it obstructs some procedure akin to sexual multiplication or because it reduces the concentration of some stimulating substance emanating from the organisms below the limiting level. Some other phenomena are known which seem to be more or less in parallel. Working with the infusorian *Enchelys*, ROBERTSON showed[1] that when two individuals are put together into the same drop of culture medium, not twice, but from four to six or eight times as many individuals are produced in 24 hours as in cultures started with a single individual, and this without any conjugation or encystment. He brings forward evidence, not altogether satisfactory, that this effect is due to the elaboration by *Enchelys* of a stimulating substance out of the autolysed remains of bacteria on which it feeds. Water is said by DRZEWINA and BOHN [2] to be harmful to *Stentor* if the volume is large, and, as an example of more specific effects, GOULD found [3] that the development and maintenance of the male phase in the mollusc *Crepidula* requires the presence in the immediate vicinity of a larger individual, usually transitional or female in sex. Finally, in a very clear series of experiments with the fly *Drosophila* on the influence of density of population on longevity, PEARL and PARKER [4] reach the result that the most favourable density is not the minimal density. The average duration of life increased with density of population up to about 40 flies per bottle where it was greatest; it then fell and was equal at densities of 2 and about 90, and thereafter diminished with progressive overcrowding. From these examples it is evident that organisms may exercise a favourable influence on other individuals of the same species, and it is worth while looking for further instances to see if it is a general phenomenon. Human hygiene has taught us very thoroughly that there may be too many people for the best welfare; it is possible that there may also be too few. On the physical side we may question the probability of this, and we are never likely to have any indubitable and unequivocal experience to make sure one way or the other; intellectually and spiritually the value of human companionship will hardly be doubted, and by the influence of the spirit on the flesh this would probably entail some carnal gains as well. Perhaps the basis of our social habit of life will be found by the further analysis of ROBERTSON'S phenomenon; in any case loneliness seems to be a generally harmful influence.

[1] Biochemical Journal, 1921, vol. xv., p. 612.
[2] Comptes Rendus Soc. Biol., 1921, vol. lxxxiv., p. 917.
[3] Jour. Exp. Zool., 1919, vol. xxix., p. 113.
[4] Amer. Jour. of Hygiene, 1923, vol. iii., p. 94.

Annotations.

"Ne quid nimis."

THE DIRECTOR-GENERAL A.M.S.

IT is announced officially that Sir John Goodwin will retire from the position of Director-General A.M.S. as from July 29th next, when he will be succeeded by Sir William B. Leishman. Sir John Goodwin was called to the post he will shortly vacate at a time of grave stress. During the first three years and a half of the war Sir Alfred Keogh had charge of the gigantic developments in the Service entailed upon this country by our bitter struggles upon widely separated fronts, and in circumstances where past experience offered no direct precedents. It was, therefore, a high honour to Sir John Goodwin that he should be selected to succeed Sir Alfred Keogh in his task, and, as we all know, he undertook the huge responsibilities manfully. When at last peace arrived he found himself faced with the vast anxieties bound up with the settling-down processes, and in many and difficult situations he has won high repute among his colleagues, medical and civil, for untiring attention to duties and a very real kindness in their discharge. No chief of the A.M.S. has ever more anxiously guarded the interests of his brother officers, and always with an eye upon the well-being of the soldier.

Sir William Leishman takes over the appointment with credentials which can hardly ever have been possessed in so many directions by any of his predecessors. Assistant Professor of Pathology at the Royal Army Medical School, and later Professor of Pathology at the Royal Army Medical College, Sir William Leishman has served as president of the Society of Tropical Medicine and Hygiene, and as a member of the West Africa Fever Commission and of the Medical and Sanitary Committee of Tropical Africa (Colonial Office). As the discoverer of the causal organism of kala-azar he became F.R.S., while his work in the war is too recent and too well known to need detailing. This is a great record, and Sir John Goodwin may feel happy in handing over the reins to Sir William Leishman with whom he has worked in coöperation for the past 25 years.

THE ÆTIOLOGY AND OPERATIVE TREATMENT OF HALLUX VALGUS.

A LONG, statistical paper on hallux valgus, by Dr. Torsten Sandelin,[1] of Helsingfors, shows that there is much still to be learnt about the ætiology and treatment of this deformity. He began by investigating its incidence, and after examining some 3200 feet, he came to the conclusion that if a deviation of only 15° is to be accepted as coming within the term hallux valgus, then 80 per cent. of Finnish women may be said to suffer from this condition. Its incidence increases with age; between the ages of 3 and 6 it was only 10 per cent., while at the age of 60 it was 60 per cent. It has generally been assumed that hallux valgus and flat-foot often occur together. So they do, and Dr. Sandelin's statistics show that the greater the lateral displacement of the big toe, the more frequent is its association with flat-foot. But a more common and significant association is that of hallux valgus with flattening of the transverse arch formed by the heads of the metatarsal bones. About half the cases of flattening of this arch were associated with hallux valgus, which was found in barely one-third of the cases in which this arch was retained. In 54 per cent. of all the cases of hallux valgus there was a history of it in the patient's family. But, considering how common the deformity is, this figure can hardly be accepted as convincing evidence of the disease being hereditary or familial. As for the influence of badly fitting boots,

[1] Finska Läkaresällskapets Handlingar, November–December, 1922.

it has been assumed that they play an all-important part. It has even been argued that true heredity plays no part, but that pseudo-heredity is of importance in this respect that successive generations in the same family usually wear the same kind of boot! Dr. Sandelin's discussion of the various ætiological possibilities suggests that the genesis of hallux valgus is still very obscure. Turning to operative treatment, he points out that much ingenuity has been shown in devising new operations, and he refers to a certain plastic operation the author of which carries it out in ten different stages. But this inventive fertility has not been accompanied by many persevering attempts to investigate the late results of the various operations. Dr. Sandelin has attempted to fill this gap in our knowledge by examining again the patients operated on for hallux valgus since 1904. He was able to trace 107 patients a year or more after operation. In most cases an operation had been performed on both sides, and the procedure usually adopted was amputation of the head of the first metatarsal bone under local anæsthesia by Hueter's method. Only two of the patients thus treated were dissatisfied with the results, and one of them was a woman, aged 41, who suffered from articular rheumatism and weighed 100 kilos. On the other hand, in none of the cases in which the operation was limited to removal of the bursa and only the most prominent part of the head of the first metatarsal bone (Schede's operation) were the patients entirely relieved of their symptoms, and in no case was the displacement completely corrected. It is, therefore, evident that if operative treatment is to be successful it should be radical.

THE BIOLOGIST'S CONTINUUM.

MODERN biology is quite clear that the whole of the live world is a continuous series and that man cannot be sharply separated from the rest. Complete acceptance of this conclusion with all its subsidiary implications in some ways helps in the realisation of God by man and at the same time raises difficulties in the understanding of what that realisation is. The purpose of a little volume[1] recently published, written by a trained biologist and a Quaker, is to discuss some of these problems, and it is carried out with the simple sincerity which we should expect from an author of that connexion. The biologist knows that pain and sin and death are common to the whole live world, and if Mr. Unwin fails, as everyone else has failed, to find a complete answer to the insoluble question of their compatibility with God, he gives a helpful and encouraging discussion of an old problem. The main difficulty, however, which emerges from the biologist's continuum is the position of man in relation to that of the "lower" animals. Two extreme views are possible. In the first, man is unique in having a soul and an existence apart from his morphological body; the future life is reserved for him partly because he was verbally made in God's own image and partly because it is considered that there would not be room in heaven for all live things. In the second, man is the end or an end of a series which includes the whole perceptible world and he cannot therefore be different from its other components in more than a quantitative way. For the first interpretation of the world no one has much to say nowadays; verbal inspiration has gone and the heaven arranged in a Euclidean plan has been replaced by the conception that a good man realises heaven by being a good man and that the hell to which a bad man goes consists of being a bad man. At present the second interpretation receives hardly more support, though the progress of physics suggests the incorporation of what we call the dead world into the biological series. No one seems prepared to go the length of being able to stand before an oak-tree or a butterfly and say *ex animo* "You are as near God as I am." We feel still that it would be in some way a humiliation, forgetting perhaps that the Manichæans long since recognised that they were inconsistent in plucking the leaves of plants for food and carefully preserving their lice from harm. In common with other recent writers on this question, Mr. Unwin takes a middle course. Man does, in fact, differ from other animals in having a soul, but the soul is not a special creation but the product of an evolution which, known in its past history as a physical agent, may well find its future development in spiritual things. It is, therefore, uncertain at what precise point the transition occurs: the difference is quantitative rather than qualitative, and man's "spiritual nature is the development from and the outcome of the essential spirituality of the living organism." Such and such are the topics of the book; we think it will serve its author's purpose to help others to get closer to God.

[1] Religion and Biology. By E. E. Unwin, M.Sc. London: Swarthmore Press. 1922. Pp. 185. 6s.

CHAUVINISM IN MEDICAL TERMINOLOGY.

THE influential medical journal issued for 70 years from Munich, where the pure language movement in German literature has long held sway, disclaims the suggestion of the Paris press that this tendency in German medicine is an example of chauvinism. Dr. Spatz—we presume it is he—writes[1] that it was natural to expect that the attempt to delete foreign expressions would excite unfavourable comment. German medical books still contain such terms as *choc en retour*, *débridement*, *bruit de pot fêlé*, *mouches volantes*, *défense musculaire*, *formes frustes*, *petit mal*, and there seems no particular reason why good home-made equivalents should not be found for these and similar terms. Most of them have already been anglicised. Should they be successfully germanicised Dr. Spatz assures us that there is no intention of discarding from German medical literature the names of distinguished foreigners attached to various diseases and objects. German doctors will continue to speak of *Littré's* hernia, of *Dupuytren's* contraction, of *Blaud's* pills, of *Nélaton's* catheter, and of *Addison's* disease. With quick repartee he regrets what he regards as the intentional avoidance of Rontgen's name in France, where the rays are always spoken of as X rays. The attitude of "philologic super-nationalism," he thinks, cannot stand; the sweeping of German medical literature free of foreign crumbs has nothing to do with nationalism. It has already proceeded some way, for at the recent annual meeting of the Society of the German Medical Press, which numbers 156 members, it was agreed to commission the firm of Fleischmann and Reckzeh to publish a pamphlet containing abbreviations for the most commonly used medical technical terms, and a preliminary draft has already been submitted to a committee under the chairmanship of Dr. Spatz.

[1] Münch. med. Wochenschr., 1923, i., 39.

VARIATIONS IN THE PHYSIOLOGICAL OPTIC DISC.

THE study of the normal optic disc is one to which, judging from the majority of text-books on diseases of the eye, comparatively little attention is usually paid by ophthalmologists. In the February number of the *British Journal of Ophthalmology* Mr. Ransom Pickard discusses variations in the normal physiological cup. The common form of cup is caused, as is well known, by the separation of the fibres of the optic nerves as they leave the disc to be distributed to all parts of the retina, and it is generally assumed that, in the absence of either glaucoma or optic atrophy, the size of the cup remains constant from childhood to old age. Mr. Pickard points out what must be common knowledge to all who are accustomed to use the ophthalmoscope, that there are several different types of physiological cup, and further, what to many will be new, that in certain cases which he has examined and re-examined at various intervals of time, their size tends to increase with increasing age. The importance of this observation lies in the possible

relation which these normal cups bear to the glaucoma cup. In some cases of chronic glaucoma there is a cup which does not occupy the whole area of the disc and yet is undoubtedly a glaucoma cup. This is a fact which, although it has not found its way into most text-books, is recognised by most ophthalmic surgeons. Mr. Pickard, in his paper, gives diagrams, taken at periods of several months apart from patients who did develop undoubted glaucoma, which strikingly illustrate the fact. In these cases the cause of the enlargement must have been the same as that which produces the typical cup of glaucoma—i.e., an abnormal increase of intra-ocular pressure. Mr. Pickard's argument is that the increase in the size of the cup which he has observed in certain normal cases is also due to intra-ocular pressure, though it may be that this has never risen above the normal. Whilst, however, this may be so, it may also be the fact that in some of these cases, at any rate, an abnormally high intra-ocular pressure may be the cause of the phenomenon. He concludes, therefore, supporting in this what has already been put forward by other writers in the matter of unduly large cups, that the enlargement of the cup in adult life, without symptoms of glaucoma, must be regarded with suspicion, and that such cases require careful watching for the development of glaucoma: whether or not there is any particular type of cup which in the absence of any evidence of increase of size ought to be regarded with similar suspicion is a further point which might be investigated. A form of cup which Mr. Pickard terms "bulbous" is one with an overhanging margin, so that the continuity of the vessels on the periphery of the disc with those lying at the base of the cup on the lamina cribrosa cannot be traced. It is rare for this to be the case round the whole margin of the disc, but it is extremely common for it to be the case as regards about half of it. This fact is hardly consistent with the common explanation of the physiological cup that it is merely the result of the separation of the nerve-fibres. It must either be the result of an anatomical peculiarity or of the intra-ocular pressure acting on the nerve-fibres between the lamina cribrosa and the superficial level of the disc. On the other hand, the appearance is far too common to suggest that there is any close connexion between it and the development of glaucoma.

THE ORIGIN OF GALL-STONES.

NUMEROUS circumstances and influences favour the development of gall-stones, but uncertainty exists as to which of them are contributory in character and which critical. With a view to the elucidation of this subject, Peyton Rous, P. D. McMaster, and G. O. Broun, of the Rockefeller Institute, have made observations on dogs under strictly controlled experimental conditions.[1] It is possible to join a rubber tube to the common bile-duct of a dog and collect the bile under sterile conditions for months. The gall-bladder should be removed at the time of intubation. Dogs thus treated remained in excellent condition. Out of 12 dogs, calculi were found in 6, and in 3 of these the bile had been sterile. The calculi—to begin with multiple and discrete—were found only in the walls of the collecting system of rubber and glass, never in the ducts themselves. Nor did they occur when the rubber or glass tubes remained clear of organic débris (dead cells and mucinoid matter). The early stages of the calculi that had formed on the glass connexions were examined by the microscope. The stones consisted of calcium bilirubinate and calcium carbonate, with a scaffolding of organic material. Cholesterol was not demonstrable in them. The majority had a centre of calcium bilirubinate surrounded by an envelope of crystalline slightly pigmented carbonate; but stones consisting almost wholly of one or other substance were found. The relation between these two salts in the gall-stones of the dog had similarities to that between calcium bilirubinate and cholesterol in human calculi. There is the same tendency in both instances for a nucleus of the pigment material to be overlaid with another substance. These observations seem to show that infection is not the essential factor of cholelithiasis. That it frequently plays the determining rôle is equally certain. This it would seem to do by damaging the duct wall, with result in desquamation—which the sterile cannula did in these experiments—and by lessening the ability of the bile channels to rid themselves of the cell débris. The débris induces or furthers the direct deposition of solids, and may catch and retain potential nuclei for stone formation, in the shape of pigment particles from higher up in the biliary system, which would under ordinary circumstances be voided with the bile.

[1] Proc. Soc. for Expt. Biol. and Med., vol. xx., 1922.

OCTO-CENTENARY OF ST. BARTHOLOMEW'S HOSPITAL.

THE 800th anniversary of the foundation of St. Bartholomew's Hospital is being celebrated from Tuesday, June 5th, to Thursday, June 7th. On Tuesday, after service at the Priory Church of St. Batholomew-the-Great, delegates will be entertained to luncheon by the governors and staff of the Medical College. In the afternoon the Prince of Wales, as President of the hospital, will receive addresses from the delegates, and in the evening old students of the school will dine together. On Wednesday afternoon a reception will be held at the Royal College of Surgeons of England, the Bartholomew Fair will take place within the hospital precincts, and a banquet will be given to the delegates in the evening. On Thursday, after service at St. Paul's Cathedral, the hospital and medical college will be "at home." During the celebrations an exhibition of historical and scientific interest will be held within the hospital. The gratifying announcement has just been made that the medical college authorities have acquired a block of modern premises in Giltspur-street to be devoted mainly to a new physiology department, which will then have separate laboratories for histology, chemical physiology, and experimental physiology, along with numerous research rooms. The size of the College necessitates and justifies this expansion, for there are at the present time in attendance 690 full-time and 88 part-time students, and the full and part-time entries which in October, 1920, amounted to 243, rose in 1921 to 266 and in 1922 to 286.

SEASONAL PHYSIOLOGICAL PHENOMENA.

THOUGH it is often tacitly admitted that the bodily functions are liable to suffer modifications with the change of the seasons, we have little precise knowledge of the incidence of such changes, and next to none regarding their causation. An example of seasonal variation often seen in the physiological laboratory is the failure of stimulus applied to the vago-sympathetic to arrest the frog's heart during the summer months. This is due to overactivity of the sympathetic fibres in the trunk, and not to inaction of the vagus. The change from the winter to the summer type of response takes place at the mating season, and Cori[1] considers that the response at different seasons has a relation to thyroid activity. It is interesting to note that Seidell and Fenger[2] found that in various mammals the iodine content of the thyroid during the months from June to November is three times as great as from December to May. Reid Hunt[3] found that guinea-pigs were least resistant to the toxic effects of acetonitrile in the winter. It seems reasonable that any effect which the seasons may produce would be due to an effect of change either in the amount of light or in the mean temperature. That light may be an important factor is shown by some recent investiga-

[1] Arch. f. exp. Path. u. Pharm., 1921, xci., 130.
[2] Jour. Biol. Chem., 1913, xiii., 517.
[3] Bull. 69, Hyg. Lab., U.S.P.H.S., 1910.

tions of Hess and his colleagues in New York. It has been shown by Hess and Unger[4] that exposure to sunlight or to the ultra-violet rays is an important factor in the prevention or cure of rickets, and this important announcement has been followed by the discovery[5] that under the influence of light rich in the actinic rays the inorganic phosphate present in the blood of infants shows a striking increase. This increase is also found to occur naturally during the summer months, when the daylight is far richer in actinic rays. The blood calcium is probably also increased. It seems highly probable that the aggravation of rickets, and the incidence of tetany in the spring, and their improvement in summer are associated with these changes.

DISTEMPER RESEARCH COMMITTEE.

As we have announced, the Medical Research Council are organising the investigation into canine distemper towards which funds will be provided by the "Field" Distemper Council. The researches will be conducted by members of the Council's staff, partly at the National Institute for Medical Research, Hampstead, but more particularly at their new farm laboratory for which a site near London has recently been acquired. As opportunities arise and suitable assistance can be secured, inquiries coördinated with these will be promoted at other centres of work, and the investigations will also be brought into relation with analogous studies in human and animal pathology. The Medical Research Council have appointed the following scientific committee to advise on the subject and to direct the investigations: Sir William B. Leishman, the new Director-General A.M.S.; Mr. J. B. Buxton, F.R.C.V.S.; Captain S. R. Douglas, F.R.S. (National Institute for Medical Research); Prof. F. Hobday; and Dr. C. J. Martin, C.M.G., F.R.S. (Director of the Lister Institute). Sir William Leishman, a member of the Medical Research Council, will act as chairman, and other members may be added to the committee as the programme develops. Communications should be addressed to the Secretary, Distemper Research Committee, 15, York Buildings, Adelphi, W.C. 2.

LETHARGIC ENCEPHALITIS AND PREGNANCY.

IN a review of recent literature on lethargic encephalitis by Dr. J. D. Rolleston, in the March number of *Medical Science*, the subject of pregnancy in this disease is discussed. In a paper read before the Medical Society of the Paris Hospitals, Guillain and Gardin, who reported an illustrative case, stated that pregnancy is sometimes normal, or that encephalitis is aggravated by pregnancy, or that premature delivery may occur after death of the fœtus, or that abortion has sometimes to be induced owing to the mother's life being in danger. The fœtus may die in utero or be born in a normal condition, or develop symptoms of encephalitis after birth. With the exception of two cases in which pregnancy occurred in women who already presented the post-encephalitic Parkinsonian syndrome, all the previous cases on record were examples of acute encephalitis occurring in pregnancy. The case reported by Guillain and Gardin was that of a women aged 28, who became pregnant five months after the onset of lethargic encephalitis, when a Parkinsonian syndrome was already well established. Pregnancy was normal, and a healthy child was born at full term, although labour was unusually slow and forceps were required. No change took place in the Parkinsonian syndrome after delivery. In the report on encephalitis lethargica, recently issued by the Ministry of Health, it is stated that in a series of women aged from 17 to 46, who were either pregnant at the time of their illness or developed encephalitis after confinement or within the period of normal lactation, the mortality was nearly 50 per cent.; but after exclusion of seven cases in which pregnancy was a more or less remote antecedent, this figure became reduced to 44 per cent., which represented the general mortality of women between the ages of 20 and 40 who contracted lethargic encephalitis during 1919 and 1920. At a meeting of the Académie de Médecine Mercier, Andrieux, and Bonnaud, of Tours, reported the case of a primipara who, on the twenty-second day of an attack of encephalitis with a myoclonic onset, gave birth to a living child and died on the fortieth day. The child had a slight attack of encephalitis, shown by myoclonic convulsions, when it was a fortnight old but recovered. The case is of interest as showing that the encephalitis, which had commenced three weeks before term and had not been treated, nevertheless did not cause premature delivery or the death of the child. In the subsequent discussion Achard related a case showing that though placental transmission of lethargic encephalitis is possible, it does not invariably occur. His patient was a woman, aged 25, who was delivered of a six months' fœtus a few hours before death, after an illness of 12 days. Histological examination of the mother's brain showed typical lesions of lethargic encephalitis, whereas the brain of the fœtus was normal.

[4] Jour. Amer. Med. Assoc., 1922, lxxviii., 1596.
[5] Hess and Lundagen: Jour. Amer. Med. Assoc., 1922, lxxix., 2210.

TUBERCULOSIS AMONG NORTH AMERICAN INDIANS.

A SENATE committee document with the above title[1] constitutes the report of a committee of the U.S.A. National Tuberculosis Association, officially appointed to investigate tuberculosis among the American aborigines. Its appearance is a reminder of the successful efforts that the United States Indian Medical Service is putting forth to rescue from disappearance the remaining tribes. Even now, we gather, the Commissioner for Indian Affairs would be glad if he had a little more money to spend on health work. But in the present century a considerable advance has been made, as the following comparison shows:—

	1900	*1922*
Hospitals and sanatoriums	5	73
Physicians	86	200
Nurses	25	100
Hospital employees	15	100
Field matrons	21	75

While health conditions remain far from ideal and much patient educational work is still to be done, it is at least satisfactory to know that for some years births have comfortably outnumbered deaths. The Indian is no longer a vanishing race.

The committee which has just reported was appointed in October, 1921, and consisted of Drs. George M. Kober (chairman), George E. Bushnell, H. E. Dearholt, J. A. Murphy, A. B. Tonkin, and Mr. W. H. Baldwin. The chief medical interest of a report which teems with ethnographical and humanitarian information, is found in its strong argument against special racial susceptibility. An exhaustive inquiry into the writings of explorers and missionaries shows that tuberculosis was certainly known among the Indians as far back as 1635. But all the available evidence suggests that it was not more common among these people than among the whites. The evidence is not, of course, statistical, yet it includes the testimony of physicians who practised for years in Indian communities. After a short contact with the white man, tuberculosis certainly became prevalent, and apparently assumed in many cases an especially virulent form. But this the committee maintains was not due to racial susceptibility but to the imposition of a markedly unfavourable environment. They show how the appropriation by colonists of the most fertile regions destroyed the wild game on which the Indians lived, and reduced the native inhabitants to a state bordering on starvation. The effect of undernourishment in increasing tuberculosis recently in

[1] Washington: Government Printing Office. 1923.

certain European countries is indicated as a parallel situation. The present poverty and unsatisfactory state of semi-civilisation under which a large proportion of the Indians are living is a continuation of these unfavourable environmental conditions. In 1914, when the death-rate of all American Indians stood at 31 per thousand, nearly one-third of the deaths were due to tuberculosis. The committee recommend the provision of two or three additional sanatoriums and a hospital for hopeless cases, the improvement of salaries for health officials, and the addition of more nurses and field matrons to the staff.

HYDROA VACCINIFORME.

Dr. Francis Eugene Senear and Dr. Harry W. Fink,[1] of the Department of Dermatology and Syphilology of the University of Illinois, Chicago, have collected 78 cases of hydroa vacciniforme seu æstivale from the literature, in addition to two cases which have come under their own observation. In 80 per cent. the sun's rays were regarded as the exciting factor, while in the rest there were additional factors, usually the wind. Hæmatoporphyrinuria, the possible ætiological significance of which was first described by McCall Anderson in 1898, was noted in 14 cases, or in 17·5 per cent., but was recorded as absent in only seven of the others, so that it is probable that in some cases, at least, the presence of hæmatoporphyrinuria accounts for the sensitisation of the individual to the actinic rays, although the origin of the hæmatoporphyrinuria cannot be explained. Hydroa vacciniforme occurs twice as frequently in males as in females, 54 cases in the present series being found in the male, and 26 in the female sex. The disease usually begins in childhood, but a few cases have started in early adult life. As a rule, the eruption ceases or becomes improved at puberty, but it may persist for a few years later. Heredity apparently plays some part, as in five cases the disease was found among brothers and sisters. It has been observed in many countries. A dark complexion is apparently not absolutely protective, as four or five cases have been reported in Italy, and one in South America. No example, however, has yet been recorded in the coloured races. Hydroa is chiefly a disease of the spring and summer months, when the luminosity of the sun's rays is greatest. March and April are the chief months for the onset of the annual attacks, with recurrences during the spring and summer months or sometimes in the autumn and winter. The exposed parts alone are usually involved, the ears, face, and dorsal surfaces of the hands being most frequently affected. Involvement of the cornea was noted in nine cases. The vacciniform type is the characteristic form of eruption, and was present in 53 of the 74 cases in which the character of the eruption was noted, but three other varieties may occur—viz., a superficial papulo-vesicular type, of which there were six cases, an impetiginous type of which there were two, and a severe bullous type of which there were five. The character of the scar formation depends on the type of eruption, varying from a very superficial type to a severe disfiguring form. The eruption is often preceded by sensations of burning or fullness in the affected parts. After appearance of the eruption the patient may suffer from itching and occasionally pain, but frequently does not complain of any symptoms. In a number of cases the onset may be accompanied by general symptoms, such as shivering, nausea, vomiting, malaise, and rise of temperature. Treatment is usually of little avail, but ointments containing quinine or esculin have been of value in some cases.

Sir Arthur Keith, whose health is restored, will deliver the first of a series of six Hunterian Lectures on Man's Posture: Its Evolution and Disorders, at the Royal College of Surgeons of England, on Monday, March 5th, at 5 P.M.

[1] Archives of Dermatology and Syphilology, February, 1923.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

IX.

THE TREATMENT OF MINOR INJURIES TO THE EYE.

THE only safe attitude to adopt towards a "minor" injury to the eye is to regard it as a possible source of serious danger, resulting in defective vision or even loss of the eye. Thus, a simple abrasion of the cornea may become infected and lead to the formation of an hypopyon ulcer. I have at the present time under my care a man whose left eye was pricked by a thorn. There was a small conjunctival wound about 10 mm. to the temporal side of the limbus. The tension was normal. In the course of a few days he developed vitreous opacities, and the absorption of blood in the wound revealed the presence of a minute perforation of the sclera through which a bead of vitreous was presenting.

Foreign Bodies.

Foreign bodies are frequently blown or otherwise propelled into the eye. In the former case they are most commonly shifted by the predominantly lateral movements of the eye towards the mid-point of the upper lid, where they are caught in the slight groove, known as the sulcus subtarsalis, about 3 mm. from the lid margin. They are easily removed after everting the lid, but this, though a simple procedure, requires some practice. Minute fragments of metal or stone are often propelled on to the cornea, where they become embedded in the epithelium. The commonest are "sparks" off an emery wheel, when grinding tools. These are almost invariably aseptic, but there is never any certainty that virulent pyogenic organisms are absent from the conjunctival sac. The first and most important line of resistance, the epithelium, is broken through, so that these injuries should always be regarded as not improbable sources of serious ulceration. Infection is most liable to occur if a lacrymal mucocele is present, and in such cases is likely to give rise to the most serious form of ulceration—an hypopyon ulcer—owing to the almost invariable presence of virulent pneumococci. The presence of a mucocele is indeed a perpetual menace of such a result, for minute foreign bodies often enter the eye, causing otherwise trifling abrasions, without giving rise to much immediate inconvenience. Particles of stone, and abrasions by leaves of plants and twigs of trees are specially liable to cause hypopyon ulcers, partly due to the fact that the offending agent conveys infection, partly to the lacerated type of abrasion, and partly to the constitutional state of the patient. The evil result most frequently occurs in elderly debilitated patients or alcoholic navvies—in both of which classes the resistance to infection is poor.

In hospital practice, with ideal conditions and skilled assistance, the removal of such foreign bodies is a simple matter. The eye is rendered anæsthetic with 2 per cent. solution of hydrochloride of cocain, the lids are separated by two fingers of the left hand, which also control the eyeball by gentle pressure through the lids, and the foreign body is removed by a spud or discission needle. If very minute, the foreign body may be seen with difficulty. Its position may be indicated by the position of a few dilated conjunctival vessels. These injected vessels are nearest to the site of the foreign body, and as they are radially distributed they act as a pointer to it. Even then the particle may only be visible under good oblique illumination and with the assistance of a magnifying glass or corneal loupe. It may be necessary to use the loupe in removing the foreign body. When the conditions are less favourable it is sometimes possible to remove the foreign body by means of a wisp of cotton-wool, which is less likely to do serious

damage to the cornea in the hands of the tyro than the spud or needle.

After removal of the foreign body the eye should be bandaged, and kept clean by frequent irrigation with boric lotion or saline. In most cases the minute abrasion will have healed on the following day, but it should always be inspected, and if there is the slightest grey infiltration of the site the commencement of ulceration is to be feared and appropriately dealt with. In many cases inexpert attempts have been already made to remove the foreign body. Such attempts often fail, and are often made with septic implements. Infiltration has then usually already occurred. The foreign body should be removed with antiseptic precautions, and the eye irrigated with boric lotion or even perchloride of mercury (1 in 10,000). The question arises whether atropin should be instilled. In the case of young people it is a safeguard and free from danger, consequently it should be done in all such cases if there is any doubt; but in the hands of the expert, with careful watching, it is often unnecessary, and it is to be remembered that it will entail absence from work for a week or so. In the case of adults, the instillation of a mydriatic may cause an attack of acute glaucoma. If the infiltration is slight and the conjunctival sac apparently clean, the case may be carefully watched from day to day; but if there is definite ulceration the use of a mydriatic is imperative and the case must be admitted to hospital or kept at home under constant supervision. Similar treatment is indicated in other cases of corneal abrasion in which no foreign body has been retained.

Wounds of the Lids.

Wounds of the lids are treated on general surgical principles, but two points require special emphasis. It has been the lot of most ophthalmic surgeons to meet with cases in which a wound of the lid has been sewn up and quite satisfactorily dealt with, but the fact that the instrument has passed through the lid and perforated the globe has been overlooked. In every case of wound of the lid the eyeball should be very carefully inspected and the tension of the eye gently tested. If the lids are very swollen and ecchymosed, they should be separated by retractors, which allow the lids to be lifted off the globe, so that no undue pressure is exerted on the eye.

In some cases the wound involves the lower canaliculus. In these it is best to examine the nasal lip of the wound and search for the cut end of the canaliculus. A canaliculus knife should be inserted and the canaliculus slit up for a short distance towards the lacrymal sac. The slit should be kept open by passing a dilator or small probe towards the sac on each succeeding day until the edges have become covered with epithelium. If this procedure is not adopted there will be lasting epiphora, which is difficult to treat.

Contusions.

Blows on the eye with fists and other large blunt objects may result in injuries which appear to be trivial, but in all cases a guarded prognosis should be given. Many serious injuries due to this cause have relatively inconspicuous clinical features, and are very liable to be overlooked. A few such may be mentioned—ruptured globe, with or without subconjunctival dislocation of the lens; corneal abrasion; hyphæma, traumatic mydriasis, ruptured or retroverted iris, irido-dialysis; luxation or subluxation of the lens, traumatic cataract; vitreous hæmorrhage; rupture of the choroid, detachment of the retina, macular changes, partial avulsion of the optic nerve. As with wounds of the lids, if there is much swelling of the lids they should be separated by retractors and the eyeball thoroughly inspected. If possible the eye should be examined with the ophthalmoscope. Œdema of the retina (commotio retinæ) may be seen and is not necessarily of serious import. Even if no changes are seen in the fundus the outlook should not be regarded too favourably, for in some cases the vision may be normal at first, but slowly deteriorates owing to pigmentary and other changes occurring at the macula.

In all doubtful cases complete rest in bed should be advised. In most cases it is wise to instil a mydriatic, so as to keep the ciliary muscle and iris at rest; but this is contra-indicated in elderly patients if there is any risk of glaucoma. If the lens is known to be partially dislocated I avoid the use of either a mydriatic or a miotic; the former may cause a rise of tension which would not otherwise occur, and is very difficult to combat, the latter irritates the iris and ciliary body.

It is by no means easy to diagnose any injury to the eye as merely trivial or "minor"; and unless the practitioner has devoted special attention to ophthalmic work he will be well advised to call in the aid of an ophthalmic surgeon.

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Special Articles.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

A MEETING of the General Council of this Association was held on Feb. 16th, Sir George H. Makins being in the chair. Mr. Zachary Cope was elected to serve on the Executive Committee in place of Mr. A. E. Webb-Johnson, resigned.

A discussion took place on the recommendations of the General Purposes Subcommittee with regard to a post-graduate school for London, which finally took the following form:—

1. That the post-graduate school in London should be a school of the University.
2. That the post-graduate school should comprise: (*a*) a central administrative office, (*b*) a large general hospital, and (*c*) approved special hospitals.
3. That a dean be appointed to act as the principal officer of the central organisation and to direct medical study.
4. That the general hospital should contain at least 200–300 beds and properly equipped laboratories and lecture and demonstration rooms. The general hospital should be in a central situation and possess facilities for social meetings.
5. That every opportunity should be afforded for lectures or demonstrations by persons other than members of the staff of the post-graduate school and that resident and other appointments should be open to post-graduates.
6. That the general hospital of the school should be one of the existing undergraduate teaching hospitals in a central position and should not take undergraduates.

Mr. H. J. Waring, speaking on behalf of the University of London, said that the University felt strongly the need for a post-graduate school, and urged the Fellowship to get into touch with the University. A central office was necessary, as was the appointment of a dean, but he thought it a mistake to say that the office should be at a general hospital.

The remaining clauses were approved, and it was agreed that the recommendations be sent to the University, with a request that representatives from the Fellowship of Medicine might meet with representatives of the University to discuss their scheme.

It was reported that in accordance with the further recommendations of the General Purposes Subcommittee, a conference had taken place with representatives from the staffs of the non-undergraduate hospitals in London to discuss the best means of furthering the educational objects of the Fellowship; the following resolutions, passed at the conference, had been forwarded to the President for the consideration of the Council:—

1. That in the opinion of this meeting the organisation of post-graduate teaching in London is unsatisfactory. This is due, in part at least, to the fact that the Executive Committee of the Fellowship of Medicine is not representative of post-graduate teachers.
2. That there should be elected on to the Council of the Fellowship of Medicine a representative of each hospital which is doing or is willing to do post-graduate teaching.

3. That the Executive Committee should consist of a representative of each of the hospitals doing post-graduate work with an equal number elected by the Council.

4. That these resolutions be forwarded to the Council of the Fellowship of Medicine, and that this meeting be summoned in one month's time to receive the reply of the Council.

Dr. C. O. Hawthorne, not being in agreement with the method of procedure in calling the conference, moved—

"That before coming to any decision relative to the resolutions passed by representatives of 27 non-undergraduate hospitals, it is desirable that a deputation from the hospitals should discuss the situation with representatives of the Fellowship of Medicine."

The motion was seconded by Sir Dawson Williams, who suggested that the representatives of the Fellowship of Medicine should be the General Purposes Subcommittee as enlarged in relation to the hospital policy of the Fellowship. The general feeling of the Council was that the question of carrying on for the present until the bigger scheme came into being was very urgent; and in order that no time should be lost, an amendment was moved by Dr. E. Pritchard that resolution No. 2 be adopted and the representatives, as suggested, be constituted members of the Council. The amendment, seconded by Mr. Zachary Cope, was put to the vote and carried. Resolution No. 3 was discussed at length, but its adoption was debarred owing to Clause 8 of the constitution whereby "the Executive Committee shall consist of 30 members." Sir John MacAlister, Dr. G. Blacker, and others favoured the immediate calling of a general meeting of members to revise the constitution, but as this would cause delay, it was felt that some other means must be found to get over the difficulty.

Sir William Hale-White, as chairman of the conference, expressed the desire of the conference to go forward with their scheme, and, urging upon the Council the necessity of immediate action, moved—

"That after the addition of members on the Council as provided in Clause 2 a meeting of the Council be called within a fortnight."

The motion was seconded by Mr. F. D. Saner and carried unanimously.

Dr. G. H. MacLean, director of the British Division of the American University Union in Europe, referred to the post-graduate activities of Paris, Berlin, and Vienna, and appealed to the Council to do something for London without delay.

OCCUPATIONAL MORTALITY.

THE decennial supplements of the Registrar-General, dealing with occupations, are unique and have long been recognised at home and abroad as invaluable. The earliest investigation published related to the year 1851, and with each succeeding censal period the information given has been carefully elaborated. The report now issued deals with 1910–12 [1]; as the data were practically ready for publication at the outbreak of war, the delay which has occurred is notable. Apparently the information even now is only given "in view of many strong representations." The thought that such pressure was needed to save this wonderful series of reports from a breach of continuity gives cause for thinking: it is sad that such pressure was needed at a time when throughout civilised countries, as never before, the science of industrial medicine is receiving attention and being made the object of research. Economy in printing can hardly be pleaded, for previous occupational supplements have sold out and have long been unprocurable—a record not achieved by all Government publications. They certainly were cheap, as the previous one was almost given away for 1*s.* 10*d.*, and the same may be said of a predecessor at 1*s.* 6*d.* The price of the present supplement has been raised to 13*s.* 6*d.*; it contains all the essential data and some important new tables, but, nevertheless, has been bereft of the usual critical and analytical commentary by the medical superintendent which occupied 125 pages in the previous report and formed a much appreciated and often quoted résumé. Gratitude, however, for the moment is uppermost that the report has been issued, and that after all the interests of the community have prevailed over whatever or whoever was the obstacle.

[1] Supplement to the Seventy-fifth Annual Report of the Registrar-General for England and Wales. Part IV.: Mortality of Men in Certain Occupations in the Three Years 1910, 1911, and 1912. Published by H.M. Stationery Office. February, 1923. 13*s.* 6*d.*

A "Standard Population."

One notable advance has been made: a "standard population" has been fixed at that general male population (71,005), aged 25–64, which produced 1000 deaths at the beginning of the century (1900–02). In previous issues the standard population for each report has been the population which gave 1000 deaths at the period under review. Hence this standard population kept changing, and elaborate calculation was needed before the comparative mortality data of one report could be compared with those of its predecessor. When such comparisons are instituted the mortality experienced is found to have fallen remarkably for every occupation since 1890–92; a few samples from the 132 groups dealt with are given here:—

Comparative Mortality: All Causes.

—	1890–92*	1900–02†	1910–12†	Percentage fall on 1890–92.
Dock labourers	2114	1481	1127	46·7
Coal heavers	1765	1221	957	45·8
Printers	1267	994	773	39·0
Cotton operatives	1318	1114	811	38·5
Brewers	1649	1393	1023	38·0
Medical men	1118	952	693	38·0
Boiler-makers	1162	1032	754	35·1
Commercial travellers	1111	988	724	34·8
Brick-makers	857	653	567	34·0
Innkeepers	1899	1781	1265	33·4
Coal-miners	1068	885	727	32·0
All males	1155	1000	790	31·6
Tailors	1144	1027	799	30·0
Clergy	615	524	443	28·0
Shipbuilders	836	817	633	24·3
Farmers	651	596	495	24·0
Tin-miners	1628	2131	1579	3·0

* Occupied only. † Occupied and retired.

Mortality Groups.

The groups are placed in order according to the extent of the fall in mortality since 1890–92, and the order obtained closely agrees with the height of mortality in 1890–92. The most notable exception is the tin-miners, who owe their excessive mortality to an appalling death-rate from tuberculous silicosis and allied respiratory diseases; the comparative figure for phthisis in this group in 1890–92 was 586, and for other respiratory diseases 435, which remained for 1910–12 at 684 and 315 respectively; the industrial hygienist may be forgiven if he rejoices that this pernicious occupation bids fair to disappear soon from this country; the other marked exceptions are innkeepers and brewers, whose industry appears significantly to have retarded health improvement among its followers. Otherwise there is a clear tendency for those who suffered most in 1890 to have benefited most by 1910. Perhaps the most interesting of the new points brought out comes from the subdivision of the stonemasons group into those employed on sandstone, on granite, and on limestone. By this grouping the claim put forward that those exposed to silica dust (the sandstone group) would be found to suffer in excess from phthisis was put to a crucial test. The result is significant and confirms the claim, for the comparative phthisis mortality in the sandstone group is given as 415, that for the limestone group as 129 and the granite group as 127. Another somewhat similar case of exposure to dust is that of iron-miners; here hematite miners, now given alone, are found with a comparative phthisis mortality of 123, compared with 73 for all iron-miners, or 53 if the mortality of hematite miners

be first subtracted from the total group. Again, among coal-miners, with their generally low phthisis mortality, the Nottingham miner has a phthisis figure of 53, compared with 107 for the Lancashire miner.

The mortality from cancer shows a definite increase, not only among all males from 54 in 1890–92, to 68 in 1900–02, and 78 in 1910–12, but also among most of the occupational groups. The chimney-sweep is an exception, for his comparative cancer figure has fallen from 152 to 107. He no longer heads the list as of old, but has been passed by brewers with a figure of 125, messengers with one of 118, slaters with one of 117, and bronze-workers with one of 108. The whole question of the occurrence of cancer, as exhibited by occupational groups, calls for close investigation. Valvular disease of the heart is another cause of death which increased among all males from 36 in 1900–02 to 42 in 1910–12; here the list is headed by lead-miners (68), lead manufacturers (59), inn-servants (62), hairdressers (58), hair and bristle workers (59), and furriers (57).

There can be no doubt that the data now published will provide material for careful and close investigation, from which interesting results may certainly be expected.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Indian Science Congress.

THE tenth annual meeting of the Indian Science Congress was held under the auspices of the Asiatic Society of Bengal in Lucknow from Jan. 8th to 13th, with Sir William Marris, Governor of the United Provinces, as patron. Sir M. Visvesvaraya, president, delivered the inaugural address in the Medical College on the evening of Jan. 8th, and the Congress thereafter broke up into its different sections. The Medical Research Section was presided over by Major H. W. Acton, professor of pathology at the School of Tropical Medicine, Calcutta, and 50 papers were read in this section.

A considerable number of the communications were by Indians.

Vitamins: Hydrogen-Ion Concentration.

Colonel R. McCarrison read a paper on the Relationship of Vitamins to Disease, and in the discussion the suggestion was made that symptoms arising in what are known as deficiency diseases might be wholly due to toxic substances produced in the various food grains. This was supported by a number of striking illustrations, especially in connexion with the varieties of rice used in areas where beri-beri is endemic. A paper by Major Acton and Major R. W. Chopra on the Influence of pH on the Activity of Pressor Bases opened up a field for future research, as it demonstrated that the hydrogen-ion concentration affected the action of these bases. Thus, pituitrin was most active at a pH of 6·5. On similar lines was the paper by Major R. Knowles and collaborators on the Relationship of the Intestinal Protozoa of Man to the Hydrogen-ion Concentration of their Environment. After investigation of the pH of stools and intestinal mucosa, it was found that *Entamœba histolytica* in its active motile vegetative and destructive state had an almost constant acid pH of 6·2. Emetine requiring an alkaline pH, before treatment of amœbic dysentery could be effective, it was necessary to alkalinise the intestinal tract by some preliminary salt.

Hookworm Disease.

Dr. J. B. McVail's note on a Suspected Seasonal Variation in the Ovulation Rates of Hookworms was very suggestive, and if his observations are confirmed a considerable amount of energy, time, and money will be saved as regards the treatment of infected populations. Dr. McVail noticed that during the rainy season an increase in the proportion of cases showing large egg counts occurred, and he showed a chart which apparently demonstrates a correlation between rainfall and ovulation. His tentative conclusions were that it was little use treating hookworm cases during the monsoon months, and that the best time to carry out treatment was during the hottest months of April, May, and June.

Lathyrism: Malaria.

The coöperation necessary in the elucidation of some medical problems was well illustrated by the two papers on Lathyrism by Drs. Howard and Simonsen and Captain L. A. P. Anderson, who had carried out the botanical, chemical, analytical, and experimental and clinical parts of the work respectively. Malaria was dealt with in two papers, one by Major Knowles, Major Acton, and Dr. B. Dasgupta, in which spleen puncture findings were discussed, and the other by Major J. A. Sinton on the treatment of malaria with quinine in combination with alkalies. The author demonstrated the better results he had obtained by alkalinising the patient before administration of quinine in a considerable series of unselected cases, and from a clinical point of view the paper would seem to support the work of the Calcutta School on the importance of estimating the pH concentration best suited for alkaloidal action. Colonel W. Glen Liston presented a couple of papers on recent researches on guinea-worm, and Dr. Hamilton Fairley read two very interesting notes on a Possible Serological Classification of Cercariæ with Special Reference to the Digenetic Trematodes, and a New Serological Test for *Schistosomum spindalis*, and its Practical Value. This test was carried out on the same lines as the Wassermann test, and seemed to give satisfactory results in Dr. Fairley's hands.

Epidemiology.

One of the few papers on epidemiology was read by Major A. J. H. Russell, who described an epidemic of relapsing fever in Madras Presidency. Major F. W. Cragg, in a paper on Relapsing Fever in India, had stated recently that Madras apparently escaped from this infective fever; this has now been shown to be incorrect. Dr. H. McK. Strickland, who has been for some time working at the epidemiology of plague in Bombay Presidency, sent up a paper analysing the results of seven years' epidemics in Belgaum and Dharwar districts; unfortunately this most valuable work had been cut short for financial reasons. Major J. Cunningham and Major J. A. Cruickshank read a paper on animal experiments conducted with the Madras strain of the spirochæte. They found some evidence of the production of an immunity in monkeys inoculated with the strain, as the serum from these animals protected other monkeys when given along with a dose of the spirochætes. Major Cruickshank and Dr. Ramakrishnan presented a paper on Cholera and Cholera-like Vibrios. This paper embodied the findings in a jail epidemic of cholera, and is the first paper published in India as the result of the work of a field bacteriological unit sent out from a headquarters laboratory (in this case the King Institute, Madras). There is little doubt that movable bacteriological units, such as this one, are urgently necessary in every province in India. The unit in Madras, I understand, has already proved of great value on other occasions, and the Presidency is to be congratulated on having initiated a successful scheme.

Congress Exhibition and Handbook.

On the last day of the Congress an exhibition was held, at which diagrams, maps, and models of sanitary inventions were shown. This is the first occasion on which such an exhibition has been held, and it was so successful that it is hoped that it will become a permanent feature of future meetings. Such meetings, moreover, act as a tremendous stimulus to minds which tend to become isolated and cramped, owing to the enormous distances which divide individual workers in India. For the information of members of the Congress a very well got-up handbook had been prepared, to which was added an appendix on the mills of Cawnpore.

Madras, Jan. 25th.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Affairs in Dail Eirann: The Local Government Bill.

THE discussion on the Local Government (Temporary Provisions) Bill, to which reference was made last week in THE LANCET (p. 411), went on during the week. Sir James Craig moved an amendment to the effect that a dispensary doctor or midwife of over 20 years' service, who had become permanently infirm in mind or body, might be allowed to resign on an allowance not exceeding two-thirds of salary, fees, and emoluments. He said it was necessary that young men should be encouraged to go into the service by the prospects of a decent salary or a decent pension. Mr. E. Blythe was not prepared to accept the amendment in its present form. At present a doctor, after ten years' service, was entitled to a pension, and it was possible for the Department to increase the pension in suitable cases. This Bill was only a temporary one; in the Permanent Act, which it was hoped to introduce soon, he would promise to give the proposal put forward full consideration. Sir James Craig thereupon withdrew the amendment.

The Minister's objection, however, to Sir James Craig's amendment appears to be lacking in candour. The clause which Sir James Craig wished to amend would appear to take from medical and other Poor-law officers a statutory right which they have possessed since 1919. Sir James Craig's amendment did not go so far as to protect the existing right in its entirety, but only attempted to preserve it for certain classes of individuals.

Lotteries for Hospitals.

Last week a private Bill was introduced by Dr. Vincent White for the purpose of legalising the holding of lotteries or sweepstakes in aid of hospitals and other charitable institutions. Mr. O'Higgins, Minister for Home Affairs, gave warning that the Bill would meet with his opposition on grounds of the impossibility of closing all the loopholes for corruption and fraud which would be opened. There seems to be doubt in many quarters as to whether it is wise to rely to any extent on lotteries for their support. During the past few years the hospitals have lost much of the support they used to get from the charitable public. The sums obtained from lotteries appear large in the eye of the public, and may have a further adverse influence on subscriptions.

A Ministry of Health in Ireland.

There are signs of a renewed agitation in certain quarters in favour of the establishment of a Ministry of Health in Ireland. Last week the Irish Nurses' and Midwives' Union held a public conference on health matters in the Mansion House, Dublin. After a long discussion, in which several nurses and medical men took part, the following resolution was carried unanimously: "This meeting calls upon the Government to appoint a Ministry of Health and Public Welfare, so that the very urgent needs of the community in regard to health services may be considered and dealt with without delay."

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Birth-rate and National Development.

IN a recent study, based on the figures of the birth-rates of the leading European countries, Dr. Hecke has directed special attention to conditions in the Austrian Republic. He gives the following data: As in the rest of Europe, the birth-rate in Austria was increasing up to the year 1902, when it stood at 216,717, but the increase was not proportionate with the increase of population. From 1902 the birth-rate fell constantly; in 1913 it reached 189,536, although the population was still increasing, owing to diminished death-rate. During the war the drop was catastrophic, going below 50 per cent. of the 1913 figure, but it has gradually risen again since 1919, being 148,721 in 1922—that is to say, 23 per 1000 inhabitants, against 32 in 1902. In the war years about 300,000 children less were born in Austria than might normally have been expected—a loss far outweighing that of the killed (180,000 men). Thus the age composition of the population has been materially altered. The proportion of children below 10 years is very much smaller; males aged 20 to 40 years, 326 per 1000 before the war, now number 306 per 1000. The boys below 10 years are now 164, against 202 per 1000 before the war. The drop in numbers of females, whilst not so marked, is easily discernible. In large towns and industrial districts the condition is more evident than in rural provinces or small towns. The constant increase in the ratio of adults is one of the chief reasons of the housing shortage. A comparison with statistics obtained for the year 1840 by Roscher, tells us that at that time out of 1000 inhabitants there were below 15 years of age: in Prussia 370, in Belgium 323, and in all other countries a figure between these two figures. But for 1920, in Austria, the figure was 270, showing that an increase of housing accommodation had become necessary in the next few years. All eugenists agree that the diminishing birth-rate is largely due to deliberate birth-control. Taking legitimate births in Vienna, we find that, in 1884, of 1000 married females of fertile age (15 to 45), there were born 214 living children; there were 186 in 1902, 112 in 1912, and 98 in 1921. The corresponding figures for illegitimate births per 1000 unmarried women of 15 to 45 are 84, 54, 32, 15. It must not be forgotten that the percentage of females of the child-bearing age is still increasing, owing to the increasing birth-rate of 40 to 20 years ago. Thus illegitimate births are much more controlled than legitimate births. Dr. Hecke believes that scarcity of food is the chief motive of suppression of births. For the regeneration of a race it is important to improve not only the morals of the population, but also to improve the economic situation of parents. Severe taxation of bachelors or spinsters, preference of parents in all public and private appointments, and facilities of all kinds for persons having two or more children, are only a few of the possible incentives in this connexion. The situation is improving. In parts of the country where economic conditions have taken a decided turn for the better the birth-rate is sufficient, and the number of marriages is constantly increasing. In 1903 47,000 marriages were registered, against 77,000 in 1921. Encouragement of emigration is eliminating a surplus of active persons, so that the remainder can more easily obtain food and housing in their native country, and thus found families.

Pasteur and Jenner: Celebrations in Vienna.

The centenary of Pasteur's birth was duly celebrated by the University of Vienna in a series of lectures as well as by a number of papers published in medical periodicals. The Pasteur Institute in this city also published in honour of Pasteur a synopsis of its work, and students of the University were invited to hear a series of special papers dealing with Pasteur's work. Perhaps even more appreciation, however, was accorded to the centenary of the death of Edward Jenner, whose discovery of vaccination was rapidly put to a severe test in Vienna. It is perhaps not widely known that the family of the Austrian Ambassador in Constantinople was one of the first on the Continent to be vaccinated, an occurrence which introduced vaccination into Austria. The Imperial family, which had suffered from small-pox, was soon won over to the new method, and their example served as an inducement to the whole Empire. It may safely be said that Jenner's vaccination—or rather, "equination," for the first lymph used in Vienna was from horse-pox, not cow-pox—began its triumphal spread

through Middle Europe from Vienna. A solemn ceremony was held in the University, and the various learned societies and corporations also celebrated the day. In this country, where vaccination is practically compulsory, the once dreaded disease is almost extinct; an occasional outbreak of disease imported from the Balkans only serves to emphasise the customary immunity.

The Cemeteries of Vienna.

Some 60 years ago the municipality of Vienna obtained a large tract of ground on the outskirts of the city for a central cemetery. The original area has had to be increased six times, and now occupies 2½ million square metres (about a square mile). Over a million bodies lie there—i.e., about 40 per cent. of all persons who have died in Vienna since 1869. There are 32 other cemeteries at the disposal of the municipal authorities, covering a total area of about another square mile, and containing about 1½ millions of graves. Some of these smaller burial grounds are already completely occupied, and will have to be closed down entirely. As the daily mortality amounts to about 100 persons, this means that over 30,000 corpses have to be disposed of per year. There is in Vienna nothing to prohibit the interment of the body of a Jew or of a Mahomedan amongst those of men of other faiths; the cemetery is a municipal institution, subject to no religious restrictions. The task of disposal of so many corpses is greatly eased, however, by the opening of the new crematorium, which will shortly deal with about 20 per cent. of the total material.

Vienna, Feb. 6th.

BRITISH INDUSTRIES FAIR.

THE British Industries Fair, the ninth in unbroken succession, was opened at the White City on Feb. 19th and closed to-day (March 2nd). Of the nine sections into which the fair was divided, covering almost every department of daily life, two were devoted to drugs, chemicals, and scientific instruments, and the display in these sections was one that did credit to British manufacturers, a feature of the fair being that all exhibitors were the actual manufacturers of the goods shown. A good idea of the amount of material exhibited in all the sections taken together may be gained from the fact that there were some four miles of stand frontages.

Drugs and Chemicals.

The display by Boots Pure Drug Company, Ltd., Nottingham, showed a large range of fine chemicals. Anæsthetics, analgesics, antipyretics, and hypnotics were prominent features of this stall, while attention may be directed to chloramine-"T," para-toluene-sodium-sulpho-chloromide, containing chlorine which is readily liberated on contact with protoplasm, and acriflavine, diamino-methyl-acridinium chloride, both of which possess powerful antiseptic and germicidal properties. Another feature of the exhibit was the organic arsenical drug "Stabilarsan," which is a compound of salvarsan and glucose, and for which is claimed a lower toxicity than other arsenobenzol preparations, while it is sufficiently stable to be supplied ready for use in solution. Messrs. A. Boake, Roberts and Co., Ltd., Stratford, London, E., in addition to chemicals, essential oils, perfumery materials, and flavouring essences in great variety, made a feature of sulphume, a gaseous product of burning sulphur, from which all impurities are removed by washing in water. It can be used as a germicide, insecticide, and "raticide." The British Drug Houses, Ltd., Graham-street, London, N., showed a pure glucose for use in surgical and medical practice: a preparation of barium sulphate guaranteed free from the dangerous soluble salts; contramine, whose employment in the treatment of syphilis is familiar; and duogen, a stable solution of hydrogen peroxide. The British Dyestuffs Corporation, Ltd., Spring Gardens, Manchester, offered for inspection many fine chemicals for research work, and a large selection of microscopic stains. Acriflavine and euflavine (a neutral acriflavine), benzidine, a blood reagent, dimethyl-para-amino benzaldehyde, for detecting the presence of abnormal quantities of urobilinogen in urine, and sulphanilic acid used in Ehrlich's diazo reaction in testing urine. The exhibit of Messrs. Burroughs, Wellcome and Co., Snow Hill Buildings, London, E.C., gave special prominence to the "Wellcome" bismuth salts and sodium salicylate in non-caking flakes, together with a large number of alkaloids and alkaloidal salts. Another noteworthy medicinal preparation shown was "Moogrol," a promising therapeutic agent for use in combating leprosy. A display demonstrated the successive stages in the production of "Kharsivan" and "Neokharsivan," an all-British preparation of proved utility, to replace salvarsan and neosalvarsan. Details of the preparation of "Tabloid" gland products and of "Iodicin," an organic combination admirably adapted for the intensive administration of iodine, were also shown, and there were displays of sera, vaccines, and tuberculins, of microscopic stains, of medicine cases, and a variety of "Tabloid" and "Soloid" products.

Messrs. W. J. Bush and Co., Ltd., Ash Grove, Hackney, London, E., manufacturers of flavourings, soluble and fruit essences, showed a wide range of essential oils answering to the characters and tests of the British Pharmacopœia, 1914, and to the British Pharmaceutical Codex, 1911; and Messrs. Arthur H. Cox and Co., Brighton, drew particular attention to their British formamint and aspirin tablets. A very attractive display of toilet preparations was a feature of this firm's exhibit. Messrs. May and Baker, Ltd., Battersea, London, S.W., exhibited a large number of bismuth salts, iodine preparations, mercurials, and anti-syphilitics. These latter included arsenobillon (606), novarsenobillon (914), arseno-argenticum, eparseno (132), a stabilised solution of amino-arseno-phenol, and luatol, a neutral solution of sodium and potassium bismuthyltartrate, for intramuscular injection. Sanagen Co., Ltd., Kennington Park-road, London, were also amongst the exhibitors, and excellent collections of disinfectants were shown by Messrs. Burt, Boulton and Haywood, Ltd., Salisbury House, London Wall, E.C.; by the Gas Light and Coke Company, Dauntsey House, Frederick's-place, London, E.C.; and by the United Alkali Makers and Chemical Manufacturers, Cunard Building, Liverpool.

Miscellaneous.

The McKay Artificial Limb Co., Ltd., Blackfriars-road, London, S.E., demonstrated the remarkable results which can be obtained by their mechanical limbs; the Berkefeld Pump Filter Company, Sardinia House, Kingsway, London, W.C., showed a new form of their filter for hospital use, the feature being a supply of filtered water at any temperature; the Fulham Pottery and Cheavin Filter Company, Fulham, London, S.W., were also represented, many forms of domestic and portable filters being shown.

Attention may be called to the many products of Messrs. Chivers' and Sons, Ltd., of Histon, Cambridge, jellies, jams, marmalade, and coffee essence, as well as non-alcoholic beverages. The excellence of some of the processes of preservation adopted by this firm has already been referred to in these columns. An adaptation of sponge rubber to the purposes of chair seats and bicycle saddles was shown by the Sorbo Rubber Sponge Products, Ltd., Sorbo Works, Woking, Surrey. The seats made of this substance possess a remarkable resiliency, and further extensions for the use of rubber in this connexion suggest themselves. Whether such seats would unduly retain heat is a matter for trial. Lastly, reference may be made to Messrs. Harbutt's (Bathampton, Bath, and Ludgate Hill, London, E.C.) plasticine exhibit. This substance, while primarily intended for educational and recreational purposes in schools, has found many uses in the physical laboratory and in the practice of medicine and surgery. In the latter category it has been used for ear plugs, protecting broken skin, making splints, and for demonstration work in the medical school.

Where such a large number of exhibitors are concerned it is possible in a brief article to mention a few only of the exhibits having special reference to medicine, surgery, and hygiene.

SUSSEX PROVIDENT SCHEME.—The Sussex Provident Scheme for Hospital and Specialised Medical Services, which was launched by Dr. J. F. Gordon Dill at the end of 1920, has just closed its second year's working. It has now a membership of 4000, almost entirely drawn from Brighton and Hove where the scheme originated. The receipts for 1922 were £1984 13*s.* 4*d.*, but it should be explained that the great bulk of the members were not forthcoming until the last three months of the year. The administration expenses were £159 5*s.* 10*d.* The medical institutions of Brighton were paid altogether £1010 17*s.*, the share of the Royal Sussex County Hospital being £628 10*s.* 4*d.* Other medical payments amounted to £55 7*s.* Local workmen and their employers contributed £1501 4*s.* The year 1923 commenced with a balance of £99 16*s.* The executive committee state that they welcome the coöperation of hospitals in the county; the sum received by each hospital depends entirely upon the number of members treated in their wards.

Correspondence.

"Audi alteram partem."

DELAYED AND IMMEDIATE ANAPHYLACTIC SHOCK.

To the Editor of THE LANCET.

SIR,—The first of the two cases recorded by Dr. J. Fawcett and Dr. J. A. Ryle in the issue of THE LANCET for Feb. 17th is of especial interest because of the fact that the patient had received the sensitising dose of serum 19 years before she received the dose which called forth the anaphylactic symptoms. So far as I am aware this is the longest recorded interval between the two doses, though I have not searched the literature of the subject lately to find out whether a longer has been noted. Seven years has been the longest period I have myself met with; but I have been furnished with the notes of an unpublished case in which the period was 12 years.

The case is also of peculiar interest, as the writers point out, because the symptoms and especially those due to heart failure, though delayed, were extremely severe. Such cases, however, are not unknown. In an address published in your columns some five years ago (THE LANCET, 1918, i., 323), it was pointed out that the anaphylactic state might be shown by unusual severity of the symptoms irrespective of the length of the latent period, though usually the more severe cases are associated with a short latent period; and I have before me now the notes of a patient, a soldier, who, having been wounded on July 31st, 1917, was injected with antitetanus serum the same day and subsequently had six or seven more injections, the last on Feb. 4th, 1918. At 3.30 P.M. on April 10th, 1918, he received another injection of 500 units of antitetanus serum. On April 16th, between 7 and 8 A.M.—i.e., about 5½ days later, he suddenly became ill with vomiting, dyspnœa, cyanosis, collapse, and a universal eruption of urticaria. The rash lasted all day and it was two days before the patient recovered from the attack. The usual circulatory symptoms in these cases are increased frequency (up to 160 per minute), irregularity, and enfeeblement of the pulse. The latter may not be felt at the wrist, though it is rare for this want of radial pulse to last for so long a period as in the case recorded by Dr. Fawcett and Dr. Ryle.

I am inclined to the opinion that more of these cases occurred amongst soldiers during the war than is usually believed. During the 2½ years I was in charge of the Grove Military Hospital, Tooting (January, 1917, to July, 1919), I met with eight cases of anaphylaxis, four of which were severe; and I might have missed seeing some of these cases had it not been known to the staff of the hospital that I took an especial interest in the subject. I agree with Dr. Fawcett and Dr. Ryle that the prognosis is usually favourable and that the patients are not in so serious a condition as they seem to be. Still, I have had an anxious time with several patients during the last 25 or 26 years, though I have been fortunate in not having met with a fatal case.

The writers are of the opinion that ordinary serum sickness is an anaphylactic response. I am not persuaded that such is the case. I understand that nothing resembling ordinary human serum sickness has been observed in experiments on animals. Possibly, however, normal serum sickness may be taken as evidence that the subject of it has been supersensitised. The clinical evidence is scanty, but such as it is, it goes to show that if a person undergoes an attack of ordinary serum sickness after a primary injection of serum, he is more likely to have an anaphylactic attack after a second injection than is the person who did not suffer from serum sickness after the first injection.—I am, Sir, yours faithfully,

E. W. GOODALL.

North-Western Hospital, Hampstead, Feb. 19th, 1923.

AURAL DISCHARGE IN CHILDREN.

To the Editor of THE LANCET.

SIR,—The article in THE LANCET of Feb. 17th on the Treatment of Aural Discharge in Children by Mr. Harold Barwell will excite much interest. It may be pointed out that there is an additional or alternative treatment suitable for many cases of chronic otorrhœa—namely, zinc ionisation. It is over 20 years since Prof. Leduc published his articles on the treatment of local sepsis by zinc ionisation. To determine which cases of chronic otorrhœa are suitable for the application of this method of treatment we have to decide on the cause of chronicity. 1. Is this due in any particular case to the irritation of septic fluid in the ear? 2. Is it possible to fill the whole of the cavity containing the septic fluid with zinc solution, or is a portion of the cavity inaccessible without operation? 3. Is there any factor in addition to sepsis responsible for the continuance of the suppuration, such as polypi, or granulations, or cholesteatoma? 4. Are areas—the naso-pharynx, nose, and mouth—which communicate with the ear in a septic and inflamed condition? This would make reinfection of the ear almost inevitable and a continuance or a recurrence of the discharge almost unavoidable. Zinc ionisation is an antiseptic method of treatment, and if we are to form our judgment by the results obtained in cases theoretically suitable we are bound to admit that it is efficacious.

I should estimate that the percentage of cases of chronic otorrhœa in children due to simple tympanic sepsis is approximately 50 per cent. These cases can be cured in two or three visits. In a further 25 per cent. the otorrhœa is kept up by sepsis with polypi or granulations, or with muco-purulent rhinitis, or inflamed tonsils. In these cases it is desirable to convert the dual or triple condition of sepsis + polypi, or sepsis + rhinitis, &c., into the single condition, sepsis, before attempting to sterilise the middle ear by ionisation. These cases will require on an average six to eight visits. The remaining 25 per cent. are those in which there is sepsis in a position where it is not possible to introduce the zinc solution without some form of operation. These include most of the mastoid and attic cases.

With regard to the question of enlarged tonsils and adenoids favouring the continuance of otorrhœa, the writer has observed at the ionisation clinics many patients in whom the tonsils and adenoids have been removed without cessation of the otorrhœa, and in whom ionisation readily produced a cure. Frequently other cases are cured by ionisation alone, although there is moderate enlargement of the tonsils. A small number of cases of otorrhœa with muco-purulent rhinitis or inflamed tonsils are seen, and in these ionisation of the ear without treatment of the nose or throat seldom effects a cure. I do not believe from experience that moderate enlargement of the tonsils, or a moderate degree of adenoids apart from inflammation, prevents the cure of otorrhœa by ionisation, or has any considerable influence in causing a recurrence of the discharge.

I am, Sir, yours faithfully,

Devonshire-place, W., Feb. 22nd, 1923. A. R. FRIEL.

VACCINE TREATMENT IN PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—The recent paper on pernicious anæmia by Drs. Panton, Maitland Jones, and Riddoch in which they "take the strongest possible exception" to the recommendation of Dr. Hurst and others to use an autogenous vaccine in the treatment of the disease, and Dr. Hurst's reply in your issue of Feb. 24th, furnish a striking study in contrasts as to the outlook taken by different observers in regard to the directions and methods by which further carefully directed clinical research may appropriately be directed. My experience leads me, without hesitation, to agree with Dr. Hurst's contention that a pathological

bacterial condition in the duodenum may be an important ætiological factor in the disease in question, and that the condition may be favourably influenced by appropriate vaccine treatment, always provided that all collateral indications are attended to. I would go even further and suggest, on the strength of numerous bacteriological investigations of the flora, as ascertained from material obtained at the operating table, that a faulty bacterial condition in the *small* intestine plays a more important rôle in the ætiology of many common diseases than is at present known.

Our knowledge of the normal conditions under different dietetic régimes is at present too limited to admit of any conclusions, but Dr. Hurst's observations on the presence of streptococci in the cases of pernicious anæmia recorded are useful and stimulating. If one were to venture a word of criticism on his conclusions, it would have been useful to have a more complete statement of the results of the bacteriological examinations, more particularly as to the presence or absence of coliform organisms, and if present, Dr. Hurst's reasons for disregarding them. In making this comment, I fully appreciate the force of the importance he attaches to the hæmolytic nature of the streptococci found. Dr. Hurst's observations are valuable in focusing attention on a subject of great clinical importance that is at present almost entirely neglected. The explanation of this neglect is, it appears to me, to be largely found in the study of the contrasts in outlook referred to above, and this in turn is mainly due to the present unfortunate division between the outlook and work of the skilled laboratory worker and the clinician.

Increasing importance is now being given to the study of the pathology of the living as opposed to study in the dead-house. There is equal need for the fuller recognition of the importance of the study of the bacteriology of the living; results of real practical value, however, are not likely to be quickly obtained without a more sane and wise coöperation between the work of the skilled laboratory worker and the clinician than at present obtains.

I am, Sir, yours faithfully,

Edinburgh, Feb. 24th, 1923. CHALMERS WATSON.

ORAL SEPSIS IN RELATION TO PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—The contribution in THE LANCET of Feb. 10th to the subject of pernicious anæmia reopens the question of the relation of oral sepsis to the disease. Drs. Panton, Maitland-Jones, and Riddoch there state: "We are not of the opinion that oral sepsis has any proven ætiological significance in pernicious anæmia, although we freely admit that it cannot but be detrimental to a patient's health, and may at times produce secondary anæmia such as is caused by any other chronic suppurative process." This conclusion had its origin in the observation of 104 cases of pernicious anæmia under treatment at the London Hospital, in which the question of oral sepsis was particularly inquired into. Out of this number pyorrhœa was present in 47; 13 patients had false teeth; 10 carious teeth; in 12 the teeth were noted as clean; in 9 cases as good. In 21 of the whole series the mouth was described as free from sepsis.

With respect to this report, it seems to me, as a laryngologist, that two points of criticism may be raised. First, that the teeth are not the only source of mouth infection, and, secondly, that a bacteriological examination of the saliva could alone determine whether the mouth was, or was not, free from sepsis. The teeth may be sound and the gums healthy, and yet marked sepsis may be present. What is generally overlooked is that the tonsils are frequently the focus of chronic sepsis, especially when of the "flat" variety, suggestive that they are healthy. Their septic state, however, is revealed by pressing them; it is then that pus is squeezed out of the crypts and appears on the surface. This condition of the tonsils is often overlooked. I may mention a case in point. During the war an officer on active service in France came under notice for throat trouble. He complained of constant coughing and a persistent irritation of the fauces, compelling frequent swallowing of the saliva. His tonsils being "flat" they were reported as being healthy. Nevertheless, since the trouble continued, despite treatment, he was at last invalided home. When he came to me I at once suspected tonsillar infection. I pressed one of his tonsils and pus oozed out of the crypts. After the necessary treatment he was soon able to return to duty. A "flat" tonsil, although in an infective state, may be unaccompanied by signs indicative of its condition. This emphasises the necessary precaution in all cases of examining the tonsils in order to exclude them as a source of sepsis before asserting that sepsis is not present in the mouth. Again, in addition to the tonsils, it has to be remembered that nasal suppuration is also a frequent cause of infected mouths. Personally I have never seen a case of oral sepsis without septic tonsils or nasal suppuration being present. In my opinion these are the two chief causal factors in oral sepsis, and each of these is commonly overlooked.

Mouth disinfection, then, becomes an important matter apart from the teeth and gums, and tonsillar infections, unsuspected and untreated, may, after all, have a determining influence in the onset of pernicious anæmia. A recent paper[1] by Kopeloff of New York shows that bacteriological research, based upon fractional gastric analyses, establishes that the bacterial flora of the stomach is the resultant of purely external factors—namely, food and saliva. His investigations have determined that the stomach is not itself the focus of septic organisms, but that the latter are derived from the mouth. This again adds weight to the necessity of mouth disinfection and the exercise of care not to overlook chronic suppuration of the tonsils. I am, Sir, yours faithfully,

WILLIAM LLOYD.

Brook-street, Grosvenor-square, W., Feb. 23rd, 1923.

AUTO-INTOXICATION OR DEMENTIA PRÆCOX?

To the Editor of THE LANCET.

SIR,—The letter you published last week by Dr. Burr Ferguson leads me to make the following observations confirmatory of his remarks.

The symptom perhaps the most distressing to the sufferer from chronic intestinal auto-intoxication has its origin in the action of the toxins in the blood upon the cerebro-spinal system, and the relief afforded by freeing the subject from this condition is expressed at once in the alteration of the mental outlook of the individual. These patients experience a feeling of misery and mental depression, a want of control over their temper, a want of capacity to form decisions even on trivial subjects, an inability to concentrate on any mental occupation, a dull heavy pain in the head, sleeplessness, or, on the other hand, a constant desire to sleep which affords no sense of refreshment, but leaves the sufferer in a dull and stupid condition. These people are not only a source of misery to themselves, but they tend to wreck the happiness of those who have the misfortune to be associated with them. Very frequently neuralgia, especially of branches of the fifth nerve, is complained of. In some cases it becomes so severe as to be epileptiform in type. Epilepsy in varying degrees of severity is by no means a very infrequent complication. I believe that paralysis agitans, dementia præcox, disseminated sclerosis, and many cases of mania owe their origin to the fouling of the blood-supply of the brain by intestinal toxins or to secondary infections produced by them.

This condition renders the individual very liable to break down under the influence of any continued or severe mental strain, as is not infrequently seen in our

[1] American Journal of the Medical Sciences, vol. clxv., No. 1, 1923.

daily life, when it is regarded as the result of overwork. During the war I saw a large number of cases of shell shock. In all the patients suffering from this condition whom I was able to observe, I found that stasis existed in a marked degree. The normal subject does not manifest this reaction to shock. This view is held also by Dr. McNair Wilson, who tells me that he was able to confirm it by many experiments in healthy and in toxic individuals. Besides this state of mental atrophy the muscular system suffers in a similar measure, partly because of the imperfect nutrition, but largely, perhaps, on account of the changes in the cells in the brain that control them.

The schoolboy is often regarded as stupid, dull, and inattentive, when his disability is brought about solely by the presence of toxins in his circulation. A marvellous change may occasionally be effected in his mentality and general usefulness by the removal of a controlling appendix and the consequent purification of the contents of his intestinal canal. Certainly our soul is in our abdomen.

I am, Sir, yours faithfully,

Feb. 26th, 1923. W. ARBUTHNOT LANE.

L'AFFAIRE SPAHLINGER.

To the Editor of THE LANCET.

SIR,—Last October Mr. Spahlinger generously sent me a supply of his serum through the mediation of Dr. Arthur Lynch. The patient was apparently hopelessly ill with acute pulmonary tuberculosis; every symptom of the disease was markedly present, and I expected her illness would very soon have a fatal termination. Since April, 1922, I had been in attendance and prescribing vaccines and other so-called remedies for tuberculosis, with only a rapid downhill progress as a result. After a few injections of Spahlinger's serum considerable improvement took place—all the symptoms of the disease ameliorated, and the physical signs improved to a considerable degree. I can only describe the improvement as miraculous.

After more than 25 years in medical practice I can fairly claim to have had some experience. The patient is now doing well, and I am confident will in a few more months be quite convalescent, and I am quite sure all the improvement is solely due to the serum introduced by Mr. Spahlinger, of Geneva, as I have resorted to no other medication. The patient's relatives are so impressed with her recovery that they have given £600 to the appeal fund, and I have contributed my mite myself.

Your suggestion that Mr. Spahlinger should permit his serum to be tested for results by a committee of medical men is only doing again what was done in 1913–14, when about 35 cases went through the treatment at the City of London Hospital, St. George's Hospital, and the French Hospital in London.

I am, Sir, yours faithfully,

JOHN D. RICE.

Carbis Bay, Cornwall, Feb. 22nd, 1923.

To the Editor of THE LANCET.

SIR,—Permit me to add my testimony to the value of Henri Sphalinger's work on tuberculosis to that of Dr. Wansbrough Jones as set forth in his admirable letter appearing in your last issue.

I have known all about this work since Spahlinger first came to this country in 1913. I have been to Geneva, not several times, but many, in order to follow up that work, and as a consequence I have nothing but praise for the man, whom I am proud to call my friend, his ethical attitude towards the medical profession, his scientific methods, his singleness of purpose, and the clinical results of his serum and vaccines. I have often been urged to crave space in your columns for the publication of some of these results, but I have steadfastly refrained from so doing because I saw at least two objections to such a course. The one was that the time was not ripe. It had already been proved in the case of Spahlinger's "communication" to the Académie de Médecine, and strongly emphasised in the case of his "communication" to the Académie des Sciences, that it is a grave mistake in tactics to extol a remedy until you can deliver the goods. Having signed both these documents I knew, and could have called the weary weight of my letter-bag to witness. Premature proclamation offers too good an opportunity for the heathen to rage furiously together, and for the people to imagine a vain thing. Another consideration which restrained me was that the cured cases for which I could personally vouch were too few to be conclusive; for however convincing clinical results may seem to one observer to be, they are not, and ought not to be, convincing to the scientific world at large. They require multiplication and confirmation. So I held my hand, waiting and hoping for the day when Spahlinger would be able to place his complete sera and vaccines at the disposal of those qualified to subject them to experiment and control. Alas! I am still waiting. Spahlinger's work has been held up for want of funds, and he has very properly declined to submit his remedies to critical investigation until those remedies can assume their final and complete form. Such remedies as he has been able to produce since the armistice are not complete; they are, indeed, very partial, and even so, they are forthcoming in quantities relatively minute.

The closing paragraph in your leading article (Feb. 17th) suggests that Mr. Spahlinger should "submit to the independent investigation of his remedy." The answer is that there is nothing which Mr. Spahlinger so ardently desires. Since 1918 he has been praying fervently for the day when he might be in a position, by following this course, triumphantly to vindicate his scientific bona fides. But he cannot. The remedy does not exist. What little did, for a brief moment, exist, is long since exhausted. And the trouble is that it never can exist, until and unless he is relieved of his financial embarrassments. A large number of British physicians and bacteriologists, many of them at my own instance, have from time to time journeyed to Geneva to examine into the possible value of Spahlinger's treatment, and I understand that each one has returned deeply impressed with the fact that the Spahlinger methods represent an entirely new departure which is pregnant with hopeful possibilites. There is, on the showing of the Red Cross attitude alone, no doubt whatever that a strong prima facie case has been established. Nor, unfortunately, is there any doubt that, under present conditions, it is out of the question to pursue that case to a logical, demonstrable conclusion.

In these circumstances, what possible objection can there be to a press campaign to obtain the necessary funds? Why should not the enlightened members of the charitable public be informed, as they presumably would wish to be, that a possible and highly probable solution of the riddle of the White Scourge is standing in rags at their doors, in imminent danger of death by starvation? For the information of the heathen above-mentioned, I feel constrained to add that Henri Spahlinger has never accepted one centime in the way of remuneration or out-of-pocket expenses from anyone, during the whole of the ten financially anxious years that he has been engaged upon this work. I am, Sir, yours faithfully,

LEONARD WILLIAMS.

Harley-street, W., Feb. 24th, 1923.

To the Editor of THE LANCET.

SIR,—I am in agreement with you in speaking of the lack of funds to produce the Spahlinger remedies as a tragedy. After what I have seen of the results of the treatment I am convinced that it would be a tragedy of the first magnitude for humanity if the world is to be deprived of the benefits of Mr. Spahlinger's discoveries.

I have used the serum in various forms of tuberculosis in Switzerland and have been profoundly impressed with the results obtained. I have also visited Mr. Spahlinger's Institute in Geneva and examined a large

number of patients who have received treatment by his serum and are now enjoying complete freedom from symptoms and leading normal lives several years after receiving treatment. From the history of these cases it is a fair inference to make that all would now have been dead without Spahlinger's serum. In addition, I have seen and examined many patients in London treated in 1913–14 who undoubtedly owe their lives to the success of this treatment.

Numerous medical men and experts from all parts of the world have visited Geneva, inspected the Institute—where, I may say parenthetically, that every assistance is given to visiting medical men and every facility granted in both clinical and bacteriological respects—and to the best of my knowledge no adverse report has been issued. As a result of my own obaervations I have come to the conclusion that it is no exaggerated claim to make that in Mr. Spahlinger's serum and vaccine we have a remedy which far surpasses in efficiency anything previously known to the medical world.

I cordially endorse all that is said in Dr. Wansbrough Jones's letter in your issue of Feb. 24th, and fervently hope that funds will be forthcoming to enable Mr. Spahlinger to produce his remedies in such quantity that they will soon be available for the whole world.

I am, Sir, yours faithfully,

JAS. A. W. WATTS.

Late Physician to the Palace Sanatorium, Montana.
Woburn-place, London, W.C., Feb. 25th, 1923.

ERGOTISM WITH GANGRENE OF THE TOES.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Feb. 17th, p. 336, there is a note on a case of supposed ergotism with gangrene of the toes, reported by Mr. R. E. Kelly and Dr. W. J. Dilling at the Liverpool Medical Institution on Feb. 1st. Surely to prove that the patient's two attacks were really due to ergotism needs further evidence than was adduced. It is true that ergot was present in the rye bread eaten by the patient, who was a Polish Jew, aged 42 years; but the age of the patient, the fact of the patient being a male and a Polish Jew, the fact that there was no hæmorrhage on removing the toe, the absence of general arteriosclerosis, the recurrence of attacks, and the non-extension of the gangrene, are all equally points in favour of the diagnosis of thrombo-angiitis obliterans (non-syphilitic arteritis obliterans of Hebrews). It is not stated whether the tendency to gangrene was symmetrical; in thrombo-angiitis obliterans usually one foot only is affected at first. Gangrenous ergotism is hardly known to occur at present in England or even in Central Europe, whereas quite a number of cases of thrombo-angiitis obliterans have been and are observed amongst the Polish Jews of London.

I am, Sir, yours faithfully,

London, Feb. 18th, 1923. F. PARKES WEBER.

JENNER CENTENARY AT WARSAW.

To the Editor of THE LANCET.

SIR,—I have pleasure in informing you that the Warsaw Society of Hygiene celebrated at a meeting held on Jan. 23rd the anniversary of the death of the great Jenner, and in giving the following brief details of the history of vaccination in Poland. The first public vaccination establishment in Poland was established at Vilna in 1808. A decree of the Grand Duke of Warsaw (Frederick Augustus I., King of Saxony), published in 1811, made compulsory the vaccination of all children in the first year of life. In 1823 a Government vaccine establishment was opened in Warsaw; Poland had then been partitioned and Warsaw was the capital of the Polish "Congress Kingdom," within the Russian Empire, its king being the Czar Nicholas I. This establishment, after 100 years of existence, has now been closed, the present Polish Government having established a new institute. The establishment now closed had during the whole period only four directors: the chief medical officer of the province of Warsaw, Dr. Masrynski (1823–1843); Dr. Le Brun, chief physician of the Infant Jesus Hospital, and his assistant, Dr. Mühlhausen (1843–1887), and the writer of this letter (1887–1922). Latterly the institute has been under municipal administration, the Russian Government having refused to continue the subvention; since 1903 it has been housed in a building designed by myself and erected by the municipal authorities of Warsaw. This building will now be used as the municipal chemical and bacteriological laboratory. After the abolition of autonomous Polish sanitary administration in 1870, sanitary affairs, including vaccination, were neglected by the Russian Government, and small-pox epidemics were frequent. For many years I endeavoured, without result, to have vaccination made obligatory in Poland with penalties for default. Finally I suggested to the Warsaw City Council that general vaccination might be enforced in the city by application of the above-mentioned decree of 1811; this was done, with the result that small-pox epidemics disappeared. During the recent German occupation the total vaccination of the population of Poland was undertaken with lymph produced in our establishment. After the war vaccination was not, at first, enforced, but in 1920 a law was passed making obligatory the vaccination of all children under one year of age and the revaccination of all persons of Polish nationality in the country. In a paper on Jenner which I read at the above-mentioned meeting, I wrote as follows: "If we were to make the bills payable between nations, not monetary, but cultural and economic, the international balance-sheet would show interesting results—results which unfortunately are, and perhaps will for long be neglected by the politicians. But it is certain that the principal place, as regards hygiene, belongs to England. England was the original home of sewerage systems and other methods of sanitation, and for many advances in medicine—for example, those connected with antisepsis and anæsthetics—the world stands deeply in her debt."

I am, Sir, yours faithfully,

Warsaw, Feb. 14th, 1923. JOSEPH POLAK.

INFECTIVE ENDOCARDITIS IN THE ELDERLY.

To the Editor of THE LANCET.

SIR,—"If there is a primary cardiac rheumatism," Dr. F. J. Poynton says (THE LANCET, Feb. 3rd, p. 218), "why should it not conform to other great infections and be of all grades of severity?" The occurrence of infective endocarditis in later life, I think, is apt to be overlooked, amongst the infirmities of age, and the slowing of all processes, whether of health or disease.

A woman of over 70 showed an indolent ulcer of recent appearance, on the right shin. Soon after, another, she thought, was about to come, on the left shin. I saw there a small purpuric patch and began to reason that the cause of ulceration was not an initial abrasion, but a necrotic area in the vascular periphery. Closer observation revealed a number of minute ecchymoses. A new view could now be taken of other symptoms, assumed at first to be of a chronic or degenerative order. These were an irregular cardiac rhythm, slight systolic murmur at apex and aorta, albuminuria, and mild pyrexia. The first ulcer healed, the second formed, and has remained chronic; albuminuria was transient; the heart varies; the patient, never confined to bed, moves about.

A man of 75 came under observation two years ago. He had taken to bed with pulmonary congestion and pyrexia; had muscular tremors, small pupils, and lapsed into somnolence from which he was readily roused; an aortic diastolic murmur was audible. Tremor, an erratic temper, and a soporific habit he has retained. Recently he was taken with dyspnœa, accentuation of aortic murmur, œdema of feet, and a minute hæmorrhagic rash upon the legs.

In cases like these histories are hard to elicit; septic foci may not be found, blood examination, if made, may prove indecisive, autopsies are not likely to follow for verification. But digitalis and perchloride of iron will have their place in treatment, and the course of that senescence will have interest to one who has rightly recognised in it a progressive cardiac infection.—I am, Sir, yours faithfully,

Bristol, Feb. 21st, 1923. DAVID A. ALEXANDER.

THE DISPENSING OF PRESCRIPTIONS.

To the Editor of THE LANCET.

SIR,—My attention has been drawn to the letter in your issue of last week signed by Dr. Clark Trotter, the medical officer of health for Islington, on the dispensing of prescriptions. I have no knowledge of the campaign in Islington to which Dr. Trotter refers, but I have no doubt the facts, if they are available to my Society, will be investigated by them, for they certainly call for some investigation.

My object in writing at this stage is to express my great regret that a professional man holding the important post of medical officer of health should have thought fit to take a method of dealing with the matter which, to say the least, is not what the authorities or the public expect from a public servant in Dr. Trotter's position. If there was anything seriously wrong no one knows better than Dr. Trotter that the Ministry of Health should have first of all been communicated with and, either through them or directly, the attention of my Society called to any ground of general complaint.

I deprecate the reference in the letter to the remuneration which Dr. Trotter assumes the pharmacist receives for dispensing. It is not the argument one expects from professional men. I express no opinion as to the adequacy or otherwise of that remuneration, as it has no bearing on the alleged delinquencies; whether the remuneration is satisfactory or not, the exercise of due skill and care on the part of the pharmacist is essential, and I am satisfied it will be found that pharmacists in the main do their duty.

I think the medical profession will share my regret that Dr. Trotter has been so unwise as to excuse his letter by inferring that because so many charges have been made against the panel doctor it was wise to "show up" the chemist. The medical profession well know that pharmacists have never brought any charges against panel doctors, and his comment is obviously open to the retort that if the charges against panel doctors are well founded it is no answer to them, if it be a fact, that other people are open to similar charges.

It is difficult to understand why the letter was written, but more difficult to appreciate the action of a medical officer of health attempting to create and to foster antagonism between the medical and pharmaceutical professions. Fortunately, although Dr. Trotter may have succeeded in depreciating the pharmacist in the eyes of the public, the great mass of his colleagues in the medical profession from personal experience know that such general charges as he has brought against pharmacists are in no way founded.—I am, Sir, yours faithfully,

E. T. NEATHERCOAT,
President, Pharmaceutical Society of Great Britain.

Bloomsbury-square, London, W.C., Feb. 27th, 1923.

THE OPPOSITION TO PANEL PRACTICE.

To the Editor of THE LANCET.

SIR,—I have read Dr. S. G. Askey's letter in THE LANCET of to-day's date together with your remarks. It would be interesting to know what meaning you wished to convey by the words: "There exist a certain number of non-panel doctors who, being hostile to the Act, persuade patients that they get better treatment by attendance as private patients." My difficulty is to persuade patients not to waste my time with their complaints against the Act. Can you name one non-panel doctor who persuades patients as you state or does "a certain number" in your unhappy choice of words mean "none"?

I think we are entitled in a scientific journal to expect your words to convey their obvious meaning. It is not as if you were some politician making reckless statements, and when called to account trying to get out of it by saying you meant something else.

Dr. Askey is not alone in imputing to you a hostile attitude towards non-panel doctors.

I am, Sir, yours faithfully,

GEORGE F. GRANT, M.B., C.M.

Brixton-road, S.W., Feb. 24th, 1923.

*** We wish that the insured person, as such, could select the practitioner by whom he wishes to be treated, but that is far from the hostility to non-panel doctors attributed to us. The insured person, who also pays private medical fees, must be persuaded in his mind that he is getting something thus that he would not get otherwise.—ED. L.

The Services.

ARMY MEDICAL SERVICES: NEW DIRECTOR-GENERAL.

Maj.-Gen. Sir William B. Leishman, K.C.M.G., C.B., has been appointed Director-General, in succession to Lt.-Gen. Sir John Goodwin, K.C.B., C.M.G., D.S.O., with effect from July 29th next.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. S. H. Woods is placed on Ret. List with the rank of Surg. Capt.

Temp. Surg. Lieut. (D) D. Barker is transferred to the permanent list.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. F. P. Lauder retires on ret. pay.

Maj. A. H. Jacob and Capt. A. S. Plant retire receiving a gratuity.

The undermentioned to be Lts. (on prob.): Capt. W. L. S. Cox (late The Queen's R.), Lt. H. A. Gilkes (T.A. Res. of Off.), and Second Lt. F. C. H. Sergeant (late R.F.A., Spec. Res.).

ARMY RESERVE OF OFFICERS.

Capt. T. D. Inch resigns his commn.

Army Dental Corps.

Capt. C. D. Currie, late Spec. List, to be Capt.

TERRITORIAL ARMY.

The undermentioned officers relinquish their commns. and retain their rank except where otherwise stated: Lt.-Col. A. Ogston (with permission to wear the prescribed uniform), Maj. A. L. Heiser, Capts. G. H. Hunt (Bt. Maj.), G. G. Middleton (granted the rank of Maj.), W. Burt, W. Scarisbrick (granted the rank of Maj.), W. L. Hibbert, T. P. Kilner, T. H. Somervell, G. W. M. Andrew, C. S. J. Kearney, J. L. Moir, R. R. Lishman, F. P. Gibson, A. C. Smith, C. A. Raison (granted the rank of Maj.), V. M. Wallis, P. J. Smyth, W. H. Milligan, J. B. Hogarth, E. G. T. Poynder (granted the rank of Maj.), F. P. Smith, J. W. Rammell, F. Standish, O. K. Wright (granted the rank of Maj.), T. G. Buchanan (granted the rank of Maj.), F. H. Davies, H. W. Greig, F. G. Harper, W. E. H. Bull, W. Tresawna, F. Simmers, J. Browne (granted the rank of Maj.), N. T. K. Jordan, J. H. Cumming, C. D. Relton, W. S. Soden, and G. D. Newton.

Capt. A. Don, having attained the age limit, is retired, and is granted the rank of Maj.

General Hospitals: The undermentioned relinquish their commns. and retain their rank except where otherwise stated: Lt.-Cols. J. Marnoch (Bt. Col.), A. W. Mackintosh (with permission to wear the prescribed uniform), and R. Waterhouse; Maj. T. V. Crosby; Capts. N. I. Spriggs, J. S. C. Douglas, F. Alcock, and J. Clark.

Capt. W. J. Stuart, having attained the age limit, is retired, and is granted the rank of Maj.

Capt. A. F. Hewat to be Maj. (Prov.).

2nd Eastern General Hospital: Capt. H. H. E. Scatliff resigns his commn. and is granted the rank of Maj., with permission to wear the prescribed uniform.

Sanitary Companies: Capt. (Bt. Maj.) W. J. F. Mayne and Capts. J. M. McQueen, D. Porter, and A. White relinquish their commns. and retain their rank.

Supernumerary for Service with the O.T.C.: Capt. R. J. McN. Love (late R.A.M.C.) to be Capt. for service with the University of London O.T.C.

TERRITORIAL ARMY RESERVE.

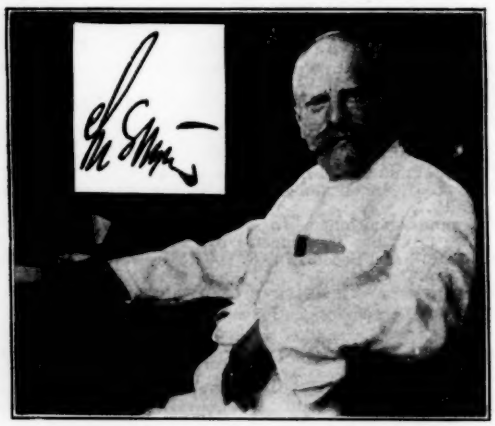
Capts. A. J. Campbell, A. M. Deane, W. N. West-Watson, and A. G. Williams relinquish their commns. and retain their rank.

Maj. T. R. Kenworthy, from Genl. List, and Capt. A. A. McWhan (from 1st London Sanitary Co.) to be Majors.

Obituary.

PROF. CHR. SAUGMAN.

Christian Saugman's sudden death at the age of 59 has robbed Denmark of a great personality and a prominent landmark in the campaign against tuberculosis. Saugman was born in 1864, and soon after he had completed his medical training he developed pulmonary tuberculosis. He underwent sanatorium treatment at Dr. Brehmer's Institute in Görbersdorf, and though the disease even at this stage was severe and advanced, it was arrested, and he returned to Denmark to take up general practice. In 1895 he read a paper before the Danish Medical Society in which he outlined his scheme for establishing the first sanatorium in Denmark. His appeal for funds met a prompt response, and by 1899 Vejlefjord Sanatorium stood ready equipped with Saugman as its chief medical officer. Since then this sanatorium has been



CHRISTIAN SAUGMAN.

the model on which many other Scandinavian sanatoriums have been established, not so much in the actual building and organisation as in the spirit of its management. He remained at his post till death, which did not come unexpectedly. A chronic brochiectasis and recurrent attacks of bronchitis had impaired a constitution enfeebled by pulmonary tuberculosis and by a virile spirit which had demanded far more of his body than it was capable of giving. An attack of gall-stones, from which he had long suffered, came on while on a trip to Munich to see Sauerbruch operate. He underwent operation in hospital at Copenhagen and died of heart failure on Feb. 7th.

Outwardly Saugman was not cast in a grand mould, but no one who had the privilege of meeting him could avoid coming under his spell. He had what the Danes call "gnist," the Germans "geist," a quality for which we lack a word. Like many men who make their mark in the world, he had no great sense of humour, what humour he possessed did not obtrude itself. Courteous and candid, he more than once found these two qualities in conflict; his courtesy was always candid, and, whenever it was possible, his candour was courteous. But there were occasions when Saugman called a spade a spade, and on a recent occasion, when the statistics of Vejlefjord Sanatorium were juggled with by a Danish colleague to prove that a liberal dietary was harmful for the tuberculous, Saugman's reply, published in the *Journal* of the Danish Medical Association, was candid and nothing more.

In the treatment of tuberculosis, Saugman was to Scandinavia what Trudeau was to the United States. One of his first achievements was to show by a statistical comparison, of the results obtained at Vejlefjord and in Switzerland, that the disease is as amenable to treatment at sea-level as in an Alpine climate. This discovery brought sanatorium treatment to the door of the poorest patient. When Saugman began work at Vejlefjord he was no mean laryngologist, and he had a well-equipped throat department. But he gradually became convinced that tuberculosis of the larynx must be cured by curing the lungs, and that local treatment is apt to be harmful. Forlanini's work on artificial pneumothorax found a keen advocate in Saugman, who, by introducing the manometer, made this operation comparatively safe. It was in the year 1906 that Prof. Saugman induced his first artificial pneumothorax, except for two done previously by Murphy's method without a manometer and giving large doses of gas at infrequent intervals. About two and a half years later Dr. Holmboe visited him, learnt his technique, returned to Norway, and a little later inaugurated a highly successful pneumothorax on a dying Englishman, who was responsible for the introduction of this means of treatment to England in 1910, and who lives and works to this day. Saugman induced artificial pneumothorax on over 600 patients, involving many thousands of actual injections. On the occasions of the ninety-eighth and the one hundred and fifty-sixth case sudden death occurred, but after that he experienced no accident.

The success of artificial pneumothorax and the disappointments experienced with cases in which pleural adhesions prevented collapse of the lung led Saugman to seek other means of splinting the lung and he found them in the thoracoplastic operations, to the technique of which he contributed much. As a student he had had a taste for surgery, and after he had passed middle age he turned himself into a surgeon, performing his own thoracoplasties. With a great capacity for conscientious detail, quick of eye and nimble of finger, Saugman became a brilliant operator.

One more achievement must be mentioned. Saugman proved that the third stage case—the case hitherto commonly regarded as being qualified for sympathy without optimism—can often be restored to comparative health and usefulness. His remarkable success in this class was the result of his teaching each patient how to order his life in every detail hour by hour and day by day as long as the disease was smouldering. In his report for 1920 he showed that every fourth patient discharged from the sanatorium in the third stage could expect to be still fit for work ten years later. Saugman was to have given a lecture on lung collapse at the Royal Society of Medicine in May, and his friends in England had arranged to celebrate the occasion.

Dr. S. Vere Pearson writes: "Prof. Saugman was one of the world's most thorough of medical healers. His first-rate ability as sanatorium doctor was founded upon personal experience as an invalid, upon very wide study of his subject, upon his thoroughness, and upon the kindliness of his disposition. In his quickness and dexterity as an operator, in his grasp of the essentials of asepsis, in his mastery of the methods of diminishing shock and pain, he showed himself to be amongst the foremost of the surgeons of Europe. It was these qualities, combined with the ever-anxious, skilled, and personally intimate after-care of the patients who had undergone operations at his hands, that contributed to results more successful than those obtained by others. His patients, too, both before and after operation, were not in urban nursing homes, but in a beautifully situated, well-conducted sanatorium, and in the hands of this excellent physician. Such a combination of skilled operator with able physician is rare.

Throughout his life Saugman was a keen scientific worker. Though so busy and versatile—his sanatorium accommodated 112 beds—he kept full and systematic notes about his patients. He was a methodical and rapid worker, a good organiser and manager, a wide reader of medicine, and an able

linguist. As chairman of one of the sections at the London International Conference of Medicine in London, with comparative ease he spoke many of his remarks alternately in four languages. The medical library at Vejlefjord was most representative and up to date. He took a keen interest in the various forms of light treatment, and his patients, among whom were cases of non-pulmonary tuberculosis, had the benefit of the latest forms of artificial sunlight. He was a master radiologist, especially with chests, and expert at ordinary physical examination. His scheme for classifying his patients[1] was devised because other systems appeared to him to lack value when put into use. He rejected the Turban-Gerhardt classification, since the vast majority ('over 90 per cent.' he said) of his cases were too advanced to come into any class other than Class III. His writings were frequent, always interesting, and well done."

Prof. Saugman was beloved by all with whom he came in contact, but above all by his patients, always his first consideration. Some of his scanty leisure was devoted to pursuing his interest in missionary work, and in the summer of 1921 he made a tour of the mission stations in Greenland. He leaves a widow, one daughter, and two sons. He is buried on the premises of the sanatorium whose guiding genius he was for so many years.

CONSTANCE LONG, M.D. BRUX., L.S.A.

Dr. Constance Long, who died recently in New York of pneumonia following influenza, spent her childhood as one of a large family in the neighbourhood of Reading. In her early youth she was very delicate, but she triumphed over physical weakness, and pursued her studies energetically. After leaving school she qualified as an art class teacher in what was then known as the School of Science and Art, South Kensington. She took up the study of medicine at the London (R.F.H.) School of Medicine for Women when she was about 23, with the idea of going abroad as a medical missionary, but eventually was not strong enough for foreign service. After qualifying L.S.A. and obtaining the M.D. Brux. in 1896, she held the posts of resident medical officer to the Clapham and Battersea Maternity Home, and resident medical officer at Dr. Barnardo's Home, Hawkhurst, Kent. During her tenure of office there was an outbreak of diphtheria in the village; there were 40 cases in the Orphanage, but thanks to Dr. Long's prompt use of antitoxin, then first becoming generally known, she did not lose a single case. Later she established herself in general practice at Crouch End and built up a successful career. She held the post of surgical clinical assistant at the New Hospital for Women and other clinical assistantships at the Royal Free Hospital and the Evelina Hospital. For many years she gave courses of lectures in first-aid, home nursing, and the care of children for the L.C.C. and other educational bodies, and then specialised in psycho-therapeutics.

Dr. Constance Long held the office of President of the Association of Registered Medical Women for two years in succession. She was one of the two women doctors elected on the Advisory Committee (Insurance Act) which discussed the Government proposals for Health Insurance in 1911, and in the autumn of 1919 she was one of the three medical women invited by the Women's Board of the War Work Council of America to attend the International Medical Women's Conference in the United States. Immediately upon her return from the States she was seized with serious illness, which necessitated operation. Upon her recovery she continued to practise as a consultant, applying principles acquired during a study of psycho-analysis with Dr. Jung of Zürich. She was a woman of wide interests; it was her sympathy with the psycho-neurotic patient met with in general practice that first urged her to the study of the new methods of treating this type of patient. She was, moreover, a hard and steady worker, and the translation of Jung's papers on Analytical Psychology under her editorship was an admirable piece of work. Her propaganda work for analytical methods included the delivery of lectures to various bodies. Some of these lectures were published during 1920 in a volume "The Psychology of Phantasy."

Dr. Long's death removes a medical woman whose breadth of outlook and wide knowledge had made her well-known and respected by her professional colleagues. Dr. Jung regarded her as an honoured collaborator. Dr. Long took little part in polemics, but when she spoke at psychological gatherings she was sure of a large and attentive audience.

[1] See Tubercle, vol. i., p. 314.

WILLIAM PRIOR PURVIS, M.D., M.S., B.Sc. LOND., F.R.C.S. ENG.

Mr. Purvis, who died on Feb. 13th, was a well-known practitioner in Southampton. He had exceptional qualifications. He became B.Sc. Lond. in 1889 and then began to study medicine at St. Thomas's Hospital. He qualified M.B. with honours in three subjects in 1892, and B.S. in 1893. In 1894 he proceeded to the M.D., and in 1896 M.S. in the University of London. In 1894 he became F.R.C.S. Eng. He held important residential posts at St. Thomas's, and later went to Southampton as house surgeon at the Royal South Hants and Southampton Hospital. For two years he served in the South African War as a member of the Southampton Volunteer Ambulance Corps.

On return from South Africa, Mr. Purvis took up private practice, and was elected to the staff of the Royal South Hants and Southampton Hospital, where he was senior surgeon and surgeon in charge of the ear, nose, and throat department at the time of his death. He was also attached to the Shirley Children's Hospital. Mr. Purvis had a high reputation as a surgeon, and was always ready to help and advise his colleagues. His generosity to his poorer patients was well known. He was a Past Master of Freemasonry and a keen member of the Hampshire County Cricket Club and other organisations. His loss will be felt throughout the county.

HEATON CLARK HOWARD, M.R.C.S. ENG.

Dr. Heaton Clark Howard, who died on Feb. 12th, at the age of 67, after a brief illness from blood poisoning, was the youngest son of the late Rev. Thomas Howard, Headmaster of the Grammar School, Newchurch, Rossendale, Lancashire. Dr. Howard received his medical education at St. George's Hospital (where he died), and qualified in 1880; he then settled in Clapham, where he practised throughout his professional life. An occasional contributor to the medical press, Dr. Howard attracted considerable attention in 1914 by an article[1] in which he described the results of his use of a liniment, prepared from raw potato-juice, in the treatment of gout and other painful conditions. Dr. Howard took an active part in local affairs. Among his appointments were those of chairman of the Works Committee of the School for the Indigent Blind, and surgeon-major to the St. John Ambulance Corps. He was an athlete of considerable prowess; in 1877 he won the United Hospitals Athletic Club silver cup (three miles championship).

THE LATE DR. RUTH M. SLADE.—Dr. Ruth Mary Slade, who died at Belfast on Jan. 15th as the result of an attack of broncho-pneumonia, was the daughter of Major S. Craig and the widow of the late Rev. E. H. Herbert Slade, formerly Government chaplain in the Punjab. She studied medicine in the University of Belfast and graduated in 1919; she took up practice in that city, and held the posts of assistant in the Belfast Hospital for Sick Children, the Samaritan Hospital, and the Maternity Hospital, and was also medical officer of the Salvation Army Home at Thorndale. Her kindly disposition and professional ability gained her the respect and regard of her medical colleagues and a wide circle of patients.

[1] THE LANCET, 1914, i., 1035.

Medical News.

UNIVERSITY OF OXFORD.—The Vice-Chancellor has approved the following appointments of demonstrators for one year from Michaelmas term, 1922. Department of Human Anatomy: Dr. M. H. MacKeith, Dr. W. W. Wagstaffe, Miss Beatrice Blackwood. Department of Physiology: Mr. H. M. Carleton, Dr. C. G. Douglas, F.R.S., Dr. E. G. T. Liddell (for three years). Department of Biochemistry: Dr. P. C. Raiment and Mr. G. L. Peskett.

In a Congregation held on Feb. 17th the degree of Doctor of Medicine was conferred on William Siegfried Dawson, Trinity College; Frederick Greig Hobson, New College; and William Tregonwell Collier, Balliol College.

UNIVERSITY OF LONDON.—At a meeting held on Feb. 21st the Senate appointed Mr. H. J. Waring to be their representative at the celebration of the 800th anniversary of St. Bartholomew's Hospital in June, 1923, and Mr. Waring and Prof. H. R. Kenwood to be their representatives at the Thirty-fourth Congress of the Royal Sanitary Institute to be held at Hull in July–August, 1923.

The Graham Legacy Committee have reappointed Dr. V. R. Khanolkar to the Graham Scholarship in Pathology for two years from April 1st next. On this occasion the value of the scholarship is £300 a year. The reappointment was made on the recommendation of the School Committee of University College Hospital Medical School, at which Dr. Khanolkar's researches have been carried on during the past three years.

UNIVERSITY OF PARIS.—During the spring a "cours de perfectionnement" in dermatology and venereal diseases will be held at the Clinique de Dermatologie et de Syphiligraphie, Hôpital Saint-Louis, under the direction of Prof. Jeanselme. The dermatological course will begin on April 9th, the venereal diseases course on May 23rd; the fee for each course is 150 francs. Lectures will be held in the hospital museum and in the amphitheatre of the clinic (Salle Henri IV.), 40, Rue Bichet (10e), Paris. The courses will include clinical, laboratory, and X ray demonstrations. A certificate will be issued at the conclusion of the course to those who have attended. A detailed programme will be sent on application to Dr. Burnier, Chef de Clinique à la Faculté, Pavillon Bazin, Hôpital Saint-Louis.

At the Clinique Médicale, Hotel-Dieu, an Easter "cours de revision" on Recent Ideas on Clinical Practice and Application of Laboratory Methods to Diagnosis will be held under the direction of Prof. A. Gilbert and Dr. M. Villaret, beginning on March 24th and comprising 34 lectures. Visits will be made to the Paris hospitals each morning, and there will be clinical and microscopical demonstrations. A certificate will be issued at the conclusion of the course, for which the fee is 150 francs. Foreign medical men are admitted. Applications and payment for both these courses must be made to the Secrétariat de la Faculté (Guichet No. 3), Faculté de Médecine, Rue de l'Ecole de Médecine, Paris.

LONDON HOSPITAL MEDICAL COLLEGE.—A lecture on Advances in the Treatment of Skin Disease by Light will be given by Dr. J. H. Sequeira on Thursday, March 8th, at 5 P.M., in the anatomical theatre of the College. The lecture will be open to senior students of the hospital and to post-graduates.

CENTRAL COUNCIL FOR DISTRICT NURSING IN LONDON.—The eighth annual report of this Council was presented at the annual meeting held on Feb. 22nd. It was announced that since in all the counties adjoining London, with the exception of Middlesex, county nursing associations have undertaken the provision of district nurses, it has been decided to concentrate upon those areas which fall within the County of Middlesex. Preliminary steps have been taken in the districts of Acton, Hanwell, Wood Green, and Ealing, and an association has been established at Friern Barnet to which a starting grant of £20 has been given. The scheme, drawn up by the Queen Victoria Jubilee Institute in conjunction with certain of the larger approved societies, for the nursing of insured persons at a payment per visit has been in operation in most parts of London. The amount of maternity nursing carried on by the district nursing associations continues to increase. It has been ascertained that the average number of nurses employed by all the federated associations is 568. Uncovered areas have been discovered in certain districts in South-East London—e.g., Dulwich, Herne Hill, Gipsy Hill—and there are also unnursed streets in parts of Eltham and in Streatham and Mitcham. It is hoped that if financial help is forthcoming neighbouring associations may be induced to provide for these areas.

A stained-glass window is to be placed in St. Mary Magdalene's Church, Lincoln, to the memory of Dr. Edward Mansel-Sympson, physician, antiquary, and archæologist. Dr. Mansel-Sympson was a devoted churchman.

ROYAL DENTAL HOSPITAL OF LONDON.—The annual general meeting of the governors will be held at the hospital, Leicester-square, W.C. 2, on Thursday, March 15th, at 5 P.M. All governors are invited to attend.

NORTH-EAST LONDON POST-GRADUATE COLLEGE.—The spring intensive course at the Prince of Wales's General Hospital will begin on March 12th and will last for 14 days. It will include lectures and demonstrations of clinical methods and cases, and work in the general wards and special departments of the hospital.

CHILDREN'S CLINIC, WESTERN GENERAL DISPENSARY.—An additional lecture in connexion with the course on Children's Diseases at this clinic (Cosway-street, London, N.W. 1) will be given by Sir William Bayliss on March 5th at 5 P.M. The subject of the lecture will be the Use of Saline Injections in the Treatment of Disease. Members of the profession are invited to attend.

RONTGEN SOCIETY.—A dinner to celebrate the twenty-fifth anniversary of the foundation of the Rontgen Society will be held on Thursday, March 15th, at the Hotel Cecil, Strand, London, W.C. The price of the dinner, including wine, will be 17*s.* 6*d.* per head. Each member is permitted to bring one guest. Members are asked to notify the hon. treasurer at the Society's house, 33, Newton-street, London, W.C. 2, not later than March 4th, how many tickets they will require.

BROMPTON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—A special course in tuberculosis will be held at this hospital from March 19th to 24th. Among those taking part are Dr. G. E. Beaumont, Dr. W. C. Bosanquet, Dr. L. S. T. Burrell, Dr. M. Davidson, Mr. Tudor Edwards, Dr. A. H. Gosse, Sir James Dundas-Grant, Sir Percival Hartley, Dr. A. C. Inman, Dr. S. Melville, Dr. A. L. Punch, Mr. J. E. H. Roberts, Dr. Batty Shaw, Dr. C. Wall, Dr. R. C. Wingfield, and Dr. R. A. Young. The course will include demonstrations in the wards, laboratories, and special departments, and lectures on the treatment of symptoms, sanatorium treatment, and prognosis in pulmonary tuberculosis.

UNIVERSITY OF EDINBURGH: WAR MEMORIAL.—On Feb. 19th Lord Balfour, as Chancellor of the University, unveiled memorial tablets on which the names of nearly 1000 victims of the war are inscribed. It is still open to Edinburgh graduates who have not yet subscribed for this object to share in the commemoration. Subscriptions to complete the cost are required, and will be welcomed. It is desired that the cost should be met by many gifts of small sums, so that the scattered sons and daughters of the University may feel that they have a part in this mark of honour to those of their colleagues who gave their lives. Subscriptions should be sent to Principal Sir J. Alfred Ewing at the University.

LADIES MEDICAL GOLFING SOCIETY.—The spring meeting will be held at West Hill Golf Club, Brookwood, on April 6th. In the morning a medal round under handicap will be played. The Canny Ryall Challenge Cup will be awarded for the best net return and the Captain (Lady Briscoe) is presenting a memento. A scratch prize will be presented by Lady Goadby, a senior handicap prize by the Society, and a junior handicap prize by Mrs. Hetherington. The afternoon will be devoted to Foursomes v. Bogey. Entries should be sent to the hon. secretary, Mrs. Laming Evans, 50, Seymour-street, London, W. 1, before March 29th.

ABERDEEN ROYAL ASYLUM: ANNUAL REPORT.—Dr. R. Dods Brown, the physician-superintendent, states that in 10·7 per cent. of the admissions to the asylum during the year mental worry or anxiety was ascribed by the friends of the patients as being the cause of illness. A few cases were resultant on the death or illness of relatives, but in the large majority the cause of worry was financial loss. In 68 cases bodily ill-health was considered to be an important factor in the causation; 42 patients were suffering from senility. Dr. Brown lays stress on the value of voluntary treatment as being early treatment. In many cases before a patient can be certified as of unsound mind the disease is well advanced. Voluntary treatment can, unfortunately, still only be given to such as are in a financial position to become private patients. During the year 196 patients were admitted, 79 males and 117 females, being 13 fewer than in 1921; 65 were discharged recovered, 44 relieved, 49 not improved, 87 died, and there remain on the register 769. The income was £63,776 and expenditure £55,920, the surplus being carried to the general revenue account.

Messrs. J. and A. Churchill announce the forthcoming publication of a new edition (the fourth) of "Diseases of the Eye," by Sir John Parsons, F.R.S., and of "Practical Midwifery," by Dr. Gibbon FitzGibbon, Master of the Rotunda Hospital, Dublin.

HÔPITAL MARITIME, BERCK-PLAGE.—From March 26th–31st an Easter course of six lectures on the Treatment of Osteo-articular and Ganglionic Tuberculosis will be given by Dr. E. Sorrel. The course will include demonstrations of operations, drainage, preparation of plaster appliances, &c. Those wishing for information should apply to Dr. Parin, Hôpital Maritime, Berck-Plage, Pas de Calais, France.

EXTENSION OF EAST LANCASHIRE INFIRMARY.—On Feb. 22nd, at the annual meeting of the East Lancashire Royal Infirmary at Blackburn, a scheme for enlarging the hospital was announced, involving an outlay of £200,000. £70,000 for this purpose will be available for the town's memorial fund. Last year the collections from the work-people reached nearly £11,000.

SMALL-POX IN THE MIDLANDS.—Six fresh cases have been notified at Doncaster and four cases at Bentley, a neighbouring township. At Clowne, Derbyshire, after a visit from one of the medical officers of the Ministry of Health, it has been decided to prosecute persons failing to notify small-pox cases and persons suffering from the disease who expose themselves in public.

THE LATE ALFRED EDWIN HARRIS.—The death of Dr. A. E. Harris, for nearly 30 years medical officer of health of Islington, has removed one of the pioneers of public health work. After qualifying L.R.C.P. & S. Edin. in 1876 he became resident medical officer to the Ophthalmic and Aural Hospital at Cork. He then practised in Gosport for five years before being appointed whole-time medical officer of health to the County Borough and Port of Sunderland. In 1882 he became medical officer of health and administrative tuberculosis officer of Islington. One of his earliest publications was on the Preventable Causes of Infantile Mortality, wherein the appointment of health visitors was foreshadowed, and many developments of the child welfare movement prophesied. Dr. Harris was a man of vision, and his forcible personality enabled him to do valuable propaganda work. His interest in the prevention and prompt treatment of infectious diseases led to special efforts directed to their reduction in Islington, with noteworthy results. Dr. Harris retired in 1921 on reaching the age of 70, but the results of his work will endure as part of the foundation on which much of the modern public health work throughout the country has been built.

ROYAL SUSSEX COUNTY HOSPITAL.—In the annual report of this hospital for 1922, submitted to the court of governors on Feb. 21st, it was stated that financial straits necessitated the closing down of more than half the hospital beds on and after Oct. 1st. When the position of the hospital was realised many persons came forward to help. In combination with the economies effected by the closing of beds, an anticipated deficit of £10,000 was turned into a credit balance of £5359 2*s.* 3*d.* at the close of the year. This happy result, the report went on to say, was mainly due to Mr. Harry Preston, and to Colonel Sir Charles A. Woolley, who added another £1000 to the £5000 which he had given earlier in the year. During the past few years Mr. Preston had been the instrument of raising nearly £15,000, including a personal expenditure of some £3000. Mr. R. Ball Dodson, chairman of the board of management, announced the receipt of a letter from the Voluntary Hospitals Commission approving of a grant of £3950 to the Royal Sussex County Hospital on condition that the hospital undertook to reopen 50 of the closed beds on March 1st this year, and the remainder not later than Sept. 1st, the beds to remain open until the end of 1924. Mr. Ball Dodson said that the board had promised to open 50 beds on March 31st, which promise had been accepted; the others would be opened on Sept. 1st, and the board of management were thus able to accept the grant. Difficulties in the way of special pay beds had hitherto proved insuperable, but thanks to the action of the trustees of the late Sir John Howard there was every prospect of 20 beds for this purpose being opened in the near future. These beds were intended to meet the needs of those who were unable to bear the expenses of a serious operation and treatment in a private nursing home. Another interesting item in the report referred to the enormous development in the orthopædic work in the X ray, electro-therapeutic, and massage departments. "Even if the present demands are to be met, great increase of accommodation is essential." The governors gave sanction for the erection of a one-storey extension to the east of the main building, and the adaptation of the adjoining basement, for the accommodation of these departments, in accordance with plans already approved, and under the conditions necessary to secure the British Red Cross grant for the purpose. The grant was one of £2000, and was given in 1919, but delay had been wise, as accommodation, which it had been expected would cost £15,000, would now be provided for a sum of between £4000 and £5000. The report alluded to the Sussex Provident Scheme, stating that the accounts of the hospital showed a substantial gain in income from that source; and the comparison of numbers of patients treated in 1921 and 1922 showed that 2530 in-patients had been admitted, compared with 2928, and 5084 out-patients, compared with 7054. In 1922, 211 beds were closed during the last quarter. The average cost per bed occupied for the whole year, £174 1*s.* 9*d.*, though £1 14*s.* less than in 1921, was greater than it would have been had all the beds been open throughout the year, for the overhead charges necessarily remained much the same. During the first nine months the cost per bed occupied was £166 10*s.* 1*d.* per annum, and during the last quarter it rose to £196 16*s.* 10*d.*, notwithstanding many economies.

The Duke of Abercorn, Governor of Northern Ireland, has appointed Prof. Thomas Sinclair to be hon. surgeon and Prof. J. A. Lindsay to be hon. physician to his household.

BRIGHTON, HOVE, AND PRESTON DISPENSARY.—At the annual meeting of the governors on Feb. 13th the opinion was expressed that the difficult financial position of the dispensary was due to a certain extent to the great efforts being made in the district to aid the funds of the Royal Sussex County Hospital, where 125 beds were closed on Oct. 1st, 1922. The dispensary covers ground largely untouched by the County Hospital; among other activities it provides for home visiting of sick people, and therefore support should be given to both institutions. The excess of expenditure over income was £845 against £808 in the previous year, largely owing to the expenditure on the Hove Hospital. This branch of the dispensary costs £3500 annually, but subscriptions from Hove only brought in £784. The figures for the Hove branch show that 294 in-patients were admitted during 1922, and in the out-patients' department 870 casualties were treated, and 192 major and 290 minor operations were performed. At the parent establishment and the Preston branch 3258 new out-patients were seen during the year, and 1936 new patients were visited in their own homes by the district medical officers, who paid 9596 visits. Mention was made of the great difficulty which was being experienced in securing an honorary medical staff for the parent establishment at Brighton and the Preston branch.

AMERICAN MEDICAL ASSOCIATION: ANNUAL MEETING.—The next annual session of the Association is announced to be held at San Francisco from June 25th to 29th, the President being Dr. Ray Lyman Wilbur of Stanford University, California. The usual division of the scientific part of the proceedings into 15 sections will take place, and meetings will be held of the five councils—namely, Judicial Council, Council on Health and Public Instruction, Council on Medical Education and Hospitals, Council on Scientific Assembly, and Council on Pharmacy and Chemistry. Communications should be addressed to the Secretary of the Association at 535, N. Dearborn-street Chicago.

THE LATE DR. THOMAS HIGGINS.—On the evening of Feb. 11th a party of armed men visited the house of Dr. Thomas Higgins, of Stradbally, in the Queen's County, and demanded admission. This was at first refused, but after some conversation the leader was admitted. A couple of minutes later he rushed from the room ordering his men to fire. Dr. Higgins was then shot dead. It is conjectured that the object of the band was merely to destroy Dr. Higgins's house and farmyard without inflicting any personal injury. While in conversation Dr. Higgins appears to have gained possession of his visitor's revolver, and the latter in alarm ordered his men to fire. The reason for the crime is, of course, unknown, but it is believed that Dr. Higgins owes his death to the fact that one of his sons, Mr. Kevin O'Higgins, is Minister for Home Affairs in the Free State Government. Dr. Higgins is the first medical man to lose his life in the struggles which have been going on in Ireland for the past four years. His death will cause widespread regret in the medical profession. Dr. Higgins qualified L.R.C.P.Irel. and L.M. in 1881, becoming F.R.C.S.Irel. in 1887. He held the post of clinical assistant in the Rotunda Hospital, Dublin, before settling in practice. In Stradbally he was much beloved, and as coroner for Queen's County his sound judgment and careful investigation of cases were greatly appreciated. He represented the Queen's County both in the Council of the Irish Medical Association and in the Irish Medical Committee. Dr. Higgins leaves a wife and large family, two of his sons being members of the medical profession.

ROYAL MEDICAL SOCIETY, EDINBURGH. — The annual dinner was held in the hall of the Royal College of Physicians, Edinburgh, on Feb. 20th. The company numbered about 100. The chair was occupied by Dr. T. McW. Millar, the senior President, and the guest of the evening was Sir Humphry Rolleston. Other guests included Lord Murray, Lord Alness, Vice-Admiral Sir John Green, Colonel S. F. Green, Principal Sir Alfred Ewing, Sir Robert Philip, the Very Rev. Dr. Wallace Williamson, Dr. George Mackay, Dr. Byrom Bramwell, and Dr. W. G. Dun. Sir Humphry Rolleston, replying to the toast of his health, proposed by the chairman, referred to the age of the Society, which is now approaching 200 years. The Society was interesting in that, as a students' society, it had received a Royal Charter. He dwelt on the many advantages to be gained in its Fellowship, and particularly on the advantage of debate. The toasts of Sister Professions and of the Edinburgh Medical School—to the latter of which Sir Alfred Ewing replied—were then proposed. An interesting feature of the evening was the election of Dr. Byrom Bramwell to the newly instituted office of Hon. President.

Public Health Services.

THE MEDICAL SERVICE SUBCOMMITTEE AS A DISCIPLINARY TRIBUNAL.

A GOOD deal was said at the recent Guildhall Conference on insurance practice in regard to the medical service subcommittees, set up under the Insurance Acts to deal with questions arising between the insured person entitled to treatment and the practitioner providing that treatment. Although those tribunals are not as effective as they might be, it is ridiculous to speak of them as a sham, as a few examples taken from the latest report of the Medical Service Subcommittee for the County of London will show.

1. For breach of medical certification rules furnished in respect of an insured person on three occasions during 1922 a practitioner was cautioned. The Ministry of Health, on being referred to, decided not to withhold the supplementary grant on this occasion, but would feel bound to take more serious view of any further breach by the practitioner of the terms of service.

2. In a case in which a practitioner refused a certificate of incapacity to an insured person because she did not engage him to attend her at her prospective confinement, the practitioner was censured for failure to comply with his terms of service, and a sum of £15 was withheld by the Ministry from the supplementary grant, to be recovered from the practitioner by deduction.

3. An insured person complained of a fee of £5 charged for cauterisation of the nose and tonsillectomy by the partner of the insurance practitioner attending her. The subcommittee held that these services did not fall within the category of those properly to be undertaken by a general practitioner of ordinary professional competence and skill, and decided that the insured person was not entitled to recover the sum.

4. In the case of a practitioner living away from his surgery and not attending there between 1 P.M. on Saturday and 10 A.M. on the following Monday, complaint was made by an insured person of inability to obtain treatment. The subcommittee admitted its powerlessness to prescribe the distance at which a surgeon may or should reside from his surgery, but regarding the arrangements in this case as unsatisfactory asked the Ministry of Health to require the practitioner to rearrange, to the satisfaction of the subcommittee, his days and hours of attendance for the treatment of insured persons.

5. A patient complained that the insurance practitioner had not advised her need of a course of treatment for anæmia, did not recommend her to go to a specialist for some condition of the ear, and did not prescribe any treatment for a slight curvature of the spine. During the inquiry the practitioner admitted advising malt and oil, but did not order it as he understood that insurance practitioners should restrict the use of this preparation to patients suffering from tuberculosis. The subcommittee took the opportunity of stating that no such restriction exists; practitioners are at liberty to prescribe cod-liver oil and malt should the condition of the patient be such as to require it, provided only that it is not prescribed as a food. The committee decided that the complaint to provide adequate treatment had not been substantiated.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, FEB. 20TH.

War Pensions Administration.

Mr. ADAMSON moved the following amendment to the Address on behalf of the Labour Party:—

"But regret that, in view of the widespread dissatisfaction that exists amongst ex-Service men and the dependents of those who died as the result of war service regarding the provisions of the Royal Warrant and the War Pensions Acts, the unsympathetic administraion of the Pensions Ministry, and the curtailment of the responsibilities of local committees, no reference is made to the institution of a thorough inquiry by a Select Committee to consider what action is necessary to secure the full discharge of the solemn obligations entered into with those who suffered injury or death in the service of the country during the Great War."

He said that the Ministry of Pensions were obsessed with the desire for economy, and he protested against the fact that the nine principal officers in the Ministry who were Service men were not on an equal footing with the 50 who were non-Service men, and asked for a different composition of and wider powers for the area appeal tribunals and the establishment of a national appeal tribunal for the hearing of appeals from the area tribunals.

Major COHEN, as a responsible official of the British Legion, deprecated the putting down of the amendment, which amounted to a vote of censure on the Government. He did not think that the suggested Select Committee was necessary or desirable. There was no doubt that the Ministry was unsympathetic, but he blamed the bureaucratic system.

Mr. SYDNEY WEBB said so far as he had seen it he commended the administration of the Ministry of Pensions, and he would be sorry if the amendment was taken as a vote of censure. He supported the amendment because he wanted to help the Ministry to find out where its regulations were not working well. He hoped that the Government would signify how this inquiry was to take place and how assistance could be given to a department which was struggling with a herculean task.

Major ENTWISTLE said he agreed with the theory that if a man was accepted as an A1 man, and he broke down during the course of his service, he ought to be held to be entitled to a pension, but that was not the state of the Warrant at present and had never been so. If the Warrant was altered it would result in an increased charge of very many millions to the Exchequer. Once they opened the door to pensions being granted for all disability, irrespective of its cause, they had no check at all upon the expenditure that would result. Complaints of lack of sympathy were greatly exaggerated, and the same was true of the Lord Chancellor's Appeal Tribunal. He had not heard any complaints that the tribunals acted unfairly.

Major TRYON, Minister of Pensions, replying to the debate, said that he had one new announcement to make. The Government proposed to introduce legislation during this session to enable a pensioner to have his life certificate signed only once in six months instead of three. During the next year he hoped they would be able to save, not on the pensions, but on the administration, nearly £1,000,000 as against last year. If they cut out the medical services the cost of administration was only 9*d.* in the £. Before this amendment was put on the paper he had already called a meeting of the Advisory Committee. He would put before them the problems that had been raised in the debate and see how they could more fully use the voluntary effort which was so invaluable to them as a Ministry in getting into that close personal touch with the pensioners. In all discussions on the Ministry of Pensions its medical and surgical responsibility was generally overlooked, and yet since the Armistice the Ministry had spent over £60,000,000 on medical treatment of the sick and wounded and in allowances for the men and their families while the treatment continued. A large proportion of the patients had been restored to health and had resumed their civil occupations. At the present time the Ministry was responsible for a daily average of 25,000 patients in hospital (of these 12,000 were in hospitals owned, managed, and staffed exclusively by the Ministry), a daily average of 80,000 patients attending as out-patients at hospitals or clinics (of whom the larger number were attending clinics owned, staffed, and controlled exclusively by the Ministry), and over 1,000,000 cases of treatment had been dealt with by the Ministry in the past three years. It was the aim of the Ministry's medical service to carry on the medical attention of cases as long as there was the smallest chance of materially improving the man's condition. He had had an analysis made recently of 1000 cases taken at random of the discharges from hospital during the last 12 months, and he found that of the general medical and

surgical cases 118 out of 1224 were discharged as completely recovered. The treatment and handling of ex-Service men suffering from nerve or brain trouble was a matter that had been constantly under discussion between himself and representatives of ex-Service men. Both his predecessors and himself had realised the importance of this question. The Ministry had 14 neurological hospitals and a large number of neurological clinics. The results of treatment had been very remarkable. In one neurological hospital devoted to the most serious cases out of 134 treated during 1922 only 9 had eventually to be certified as insane; of the remainder 68 were discharged recovered and 12 were transferred to other institutions, including some for industrial training. Between 1500 and 1600 cases passed through the neurological hospitals in a quarter. Of these on an average 20 per cent. were discharged fully recovered. The Ministry intended to carry the matter further by dealing directly with some of the most hopeful and suitable cases of ex-Service men actually certified as insane. The Ministry were going to start as an experiment separate arrangements for the treatment of selected certified cases of a hopeful type. The Government felt, at any rate, that the experiment was well worth making. They would begin tentatively with one or two small establishments and were taking steps to start the experiment at an early date.

On a division the amendment was negatived by 307 votes to 176—Government majority, 131.

The Address in reply to the King's Speech was then agreed to.

WEDNESDAY, FEB. 21ST.

Treatment of Mental Deficients.

The House went into Committee of Supply, Mr. J. F. HOPE in the chair.

On a vote of £10 in respect of certain public buildings,

Sir J. BAIRD, First Commissioner of Works, said that this was a token vote necessary to enable the Office of Works to put in hand an extension of the Rampton Institute for the treatment of persons of defective mentality who were violent and dangerous. The present accommodation was for 220 male patients and 148 females. The scheme now contemplated included the erection of additional units to accommodate 90 females and 110 males, additional nursing accommodation, and cottages for married staff. The scheme would take three years to complete and the cost would be £105,000.

Mr. HARRIS said the scheme was likely to involve an expenditure of something like £700 per head for each person provided for in the institution. It would, in his view, be very unwise to develop still further these institutions when there was a great difference of opinion among experts as to whether it was advisable to go on building these large institutions.

Sir J. BAIRD said that the Board of Control, whose responsibility it was to look after these unfortunate people, had come to the conclusion that institutions such as that for which he was asking this token vote were the best adapted for these cases.

Dr. CHAPPLE said there was no demand for this building. Had the Office of Works exhausted the possibilities of using the derelict buildings which could be found all over the country? No one should be incarcerated in any of these institutions who could possibly be kept out or treated in any half-way house or hospital.

Sir S. RUSSELL-WELLS appealed to members not to oppose the Government in this most beneficent work, which would bring relief to thousands of poor hard-worked and hard-pressed people. The wealthy could take steps to relieve themselves of their mentally deficient, but not so the poor. The removal of such afflicted creatures to institutions was best for themselves, a relief to their relatives, and a protection to the community. He had no doubt that many of the crimes committed in this country, especially those of a sexual nature, were committed by the mentally deficient, who, instead of being treated as scoundrels, should be put into institutions.

The Vote was agreed to.

The Blind Persons Act.

Mr. RHYS DAVIES asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, whether he had received representations from any quarter requesting that the Government should insist on all competent local authorities giving effect to the provisions of the Blind Persons Act, 1920; that, in view of the fact that the bulk of the blind people working in institutions for the blind were comprised within the membership of the National League of the Blind, provision should be made for representation of that league on the Advisory Committee on the Welfare of the Blind, and that in the appointment of home teachers for the blind preference should be given to competent blind persons over those who were sighted; and, if so, would he make a statement on the subject.—Sir W. JOYNSON-HICKS replied: The answer to the first part of the question is in the affirmative. As regards the second part of the question, representation of the National League on the Advisory Committee cannot be considered until they comply with the provisions of Section 3 of the Blind Persons Act, 1920, as to registration. As regards the third part of the question, the criterion is ability to do the work, and subject to this blind persons are, in fact, being appointed.

Institutions for Insured Consumptives.

Mr. BRIANT asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, what was the total accommodation provided in institutions, other than those under the control of Poor-law authorities, for insured persons suffering from tuberculous disease.—Sir W. JOYNSON-HICKS replied: The institutions approved by my right hon. friend for the treatment of tuberculosis in England, apart from Poor-law institutions, contain 19,240 beds. Of these 3310 beds are in children's institutions, but the remaining 15,930 beds are available for insured persons, although since the termination of sanatorium benefit no beds are specially reserved for such persons.

Sickness and Underfeeding.

Mr. D. G. SOMERVILLE asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, if the latest statistics of cases under the Health Insurance Acts showed any direct increase of sickness attributable to lack of sufficient nourishment.—Sir W. JOYNSON-HICKS replied: The latest figures available as to the extent of sickness amongst persons insured under the National Health Insurance Acts indicate that the aggregate amount of sickness during the past year fell short of the expectation on which the Acts were based and also of the actual experience of any pre-war year. So many factors affect the total expenditure on sickness benefit that it is impossible to assign variations in that figure to particular causes, but there is no direct evidence of an increase of sickness owing to the cause referred to by the hon. Member.

The General Nursing Council.

Mr. ALBERT ALEXANDER asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, why labour organisations representing working nurses had no representation amongst the nine nominees to the General Nursing Council for England and Wales; and whether he would take steps to repair this omission.—Sir W. JOYNSON-HICKS replied: Sixteen members of the General Nursing Council are nurses elected by the nurses on the Register. My right hon. friend sees no necessity for the appointment of additional nurse members, nor is this contemplated by the provisions of the Schedule to the Nurses Registration Act, which prescribes the constitution of the Council.

Financial Help for the Hospitals.

Mr. GILBERT asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, whether the Hospitals Commission had now distributed the whole of the £500,000 entrusted to them; how much had been allocated to hospitals in London; how much to those outside London; whether it was proposed to make any further grant; what was the total amount contributed to the Combined Appeal for the hospitals of London; how much had been distributed; and how much remained to be distributed.—Sir W. JOYNSON-HICKS replied: The whole of the £500,000 has not yet been disfributed. The Commission allocated £225,000 to hospitals in London, and the whole of that sum has now been disbursed. £275,000 was allocated to the hospitals outside London. Of this sum £181,318 has been paid to date, and the Commission intend shortly to consider the distribution of the balance after the claims in respect of the 1921 deficits have been met. The Commission have not yet made any recommendation as to the continuance of State assistance after the present grant is exhausted. Full information in regard to the work of the Commission is contained in the interim report which will be issued on Thursday next. The Ministry of Health have no responsibility for the Combined Appeal for the hospitals in London. But the following information has been obtained from the Organising Committee. It is not yet possible to state exactly the total sum contributed to the Combined Appeal. The sum actually paid into the Organising Committee amounts to £392,100, of which £260,000 has been distributed, but large additional sums are yet to be received from two schemes which are still open.

THURSDAY, FEB. 22ND.

Reopening of Pension Appeals.

Mr. TREVELYAN THOMSON asked the Minister of Pensions under what circumstances, if any, it was possible for disabled ex-Service men or their dependents to be heard with regard to a fresh application for pension or treatment allowance when they had once been turned down by the appeal tribunal.—Mr. NICHOL asked the Minister of Pensions if

any cases of ex-Service men, on which a decision had been given by a pensions appeal tribunal, had been reopened for consideration; and, if so, how many cases had been dealt with in this manner, and on what grounds.—Major TRYON replied: By the provisions of Section 8 of the War Pensions Act, 1919, the decision of a pensions appeal tribunal is final, and I am advised that it is not possible for appellants whose appeals have been rejected by a tribunal to have their cases heard again; nor, in fact, have any cases been so reopened and re-heard. In a small number of wholly exceptional cases (not more than six or seven) the Treasury has made a special concession.

Pensions and Insurance Benefit.

Major MCKENZIE WOOD asked the Minister of Pensions whether, in fixing the amount of pensions, his department took into account money received by the pensioner in respect of national health insurance benefit.—Major TRYON replied: The answer is in the negative as regards disablement pensions, to which the hon. and gallant Member no doubt refers.

Maternity and Child Welfare in Scotland.

Mr. SULLIVAN asked the Under Secretary to the Scottish Board of Health what was the sum paid in Scotland for child welfare and maternity relief or help for 1919–20, 1920–21, 1921–22, and 1922–23.—Captain ELLIOT replied: The amount of Government grant paid in relief of local authorities' expenditure under schemes of maternity service and child welfare in each local authority financial year ending in May was as follows: 1919–20, £64,692; 1920–21, £90,532; 1921–22, £235,832. The gross expenditure of local authorities in each year would be almost exactly double the amount of grant. The figure for 1921–22 is an approximation. The very large increase of grant in that year is due in the main to the increased supplies of food and milk given by local authorities, the cost of which amounted to more than half of the total expenditure. The grant for 1922–23 cannot yet be stated, but it is not expected to exceed £111,000.

Ex-Service Men in Lunatic Asylums.

Mr. OWEN PARKER asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, whether he had received protests from boards of guardians against the burden cast upon the rates owing to the action of the Ministry of Pensions in transferring to pauper lunatic asylums ex-Service men whose condition was alleged not to be due to or worsened by their military service; and whether he proposed to make a special grant towards their maintenance.—Sir W. JOYNSON-HICKS replied: My right hon. friend has received protests from some boards of guardians, but he can see no grounds on which he could justify a grant from other sources towards expenditure of this kind, which the Minister of Pensions is unable to defray.

Cost of Lunatic Patients.

Mr. EDWARDS asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, whether his attention had been called to the fact that the cost of lunatic patients chargeable to boards of guardians and maintained at asylums had so increased as to make the sum of 4*s.* per head repaid to the various unions under the Local Government Act, 1888, totally inadequate, and threw a heavy burden on local rates; and would he consider bringing in a Bill to amend this Act so as to provide for repayment of at least one half of the actual cost to them of every lunatic maintained in a county asylum.—Sir W. JOYNSON-HICKS replied: The amount of this grant was based on the estimated difference between the cost of maintenance in workhouses and in asylums respectively and, while it is true that the cost of maintenance in an asylum has increased since the amount was fixed, it is equally true that the cost of maintenance in a workhouse has also increased. My right hon. friend cannot undertake to introduce a Bill for the purpose suggested in the last part of the question.

The Question of Attributability.

Mr. LANSBURY asked the Minister of Pensions whether the fundamental principle of the royal pensions warrant, referred to in the Minister's answer on Dec. 14th last, prevented pensions being granted to men classified into grades lower than Grade A by doctors acting under the Compulsory Military Service Acts, but also certified as fit to serve at home or abroad; and whether the fundamental principle referred to also precluded the Minister from undertaking the onus of proof in those cases where there is any doubt as to the cause of a man's disability, so that a man classified in whatever category as fit for service either at home or abroad, and taken into the army as such, would be entitled to a pension unless the Minister or his officials could prove that the claim had been forfeited.—Major TRYON replied: The answer to the first part of the question is in the negative. As regards the second part of the question, it is the case that wherever a man has been invalided from the service my department accept the presumption that his disability is due to or aggravated by service, unless the balance of probability is against the man. On the other hand, in the case of a man who is not discharged from service on the ground of disablement, but who subsequently claims to be disabled by or in consequence of war service, it is clearly incumbent upon the man to produce some prima facie evidence in support of his claim. None the less, it is the practice of my department, in these as in all other cases, to assist the man in every way to establish his claim.

A Pamphlet on Vaccination.

Mr. SULLIVAN asked the Parliamentary Secretary to the Overseas Trade Department, as representing the Ministry of Health, whether his attention had been drawn to a statement that the Ministry had published a pamphlet in which the compulsory revaccination laws which existed in Prussia since 1834 were attributed to the year 1874, that being the year in which the Prussian laws were re-enacted for the new German Empire, thus concealing the fact of a serious outbreak of small-pox under conditions of strict vaccination; and whether this pamphlet, which drew a deduction in support of vaccination from inaccurate or misleading data, would be withdrawn.—Sir W. JOYNSON-HICKS replied: I am advised that the statement contained in the pamphlet to which the hon. Member refers is correct. The Prussian law of 1834 related only to soldiers in the Prussian army. Compulsory revaccination for the civil population in Prussia and the rest of the German Empire was first enacted in 1874. There is, therefore, no ground for suggesting that the pamphlet should be withdrawn.

MONDAY, FEB. 26TH.

Exports of British Morphia.

Mr. GILBERT asked the President of the Board of Trade the amount and value of British-made morphia which was exported in the years 1920, 1921, and 1922 respectively, and the countries to which these exports were consigned.—Mr. BRIDGEMAN (Home Secretary) replied: The statistics of exports for 1922 are not yet ready, but I will give the information for 1920 and 1921 so far as it is available:—

The following statement has been prepared by H.M. Customs and Excise, and shows the quantity of morphia and morphia salts registered as exported from the United Kingdom during the year 1920, distinguishing the principal countries of destination:—

	lb.		£.
Russia	331	=	5,296
Sweden	1,685	=	26,960
Germany	666	=	10,656
Belgium	1,943	=	31,088
France	9,547	=	152,752
Macao	—		—
Japan (including Formosa, and Japanese leased territories in China)	1	=	16
United States of America	1,028	=	16,448
Other Foreign Countries	3,829	=	61,264
Total to Foreign Countries	19,030	=	304,480
Hong-Kong	1	=	16
Canada	796	=	12,736
Other British Possessions	327	=	5,232
Total to British Possessions	1,124	=	17,984
Total	20,154	=	322,464

N.B.—(1) These figures also include quantities of heroin and heroin salts, which cannot be given separately.
(2) These figures do not include exports by parcel post of which no record has been kept by the Customs Department, nor do they include exports of preparations containing the drug.

[The statement from H.M. Customs and Excise contained also the figures of morphine and morphine salts exported during 1921, distinguishing the countries of destination, and prepared from the returns of exporters licensed under the Dangerous Drugs Act.]

TUESDAY, FEB. 27TH.

Women Visitors of Lunatic Asylums.

Mr. BURGESS asked the Secretary for the Home Department whether there were any women visitors of lunatic asylums; and whether the supervision of male lunatics was conducted by women or men.—Sir W. JOYNSON-HICKS replied: There are women visitors to lunatic asylums in cases where women are members of the visiting committee. The supervision of male patients is not conducted by women, but in some institutions suitable male patients are nursed by women, and this would generally be the case in the infirmary wards.

Anthrax in East Indian Wool.

Mr. TURNER asked the Secretary for the Home Department what special steps, if any, were being taken to deal with the prevention of anthrax arising from the use of East India wools in the mills of the heavy woollen districts.—Mr. BRIDGEMAN replied: The use of East Indian wool is subject to regulations made under the Factory and Workshop Act.

As being material which is liable to be infected with anthrax there is power also to deal with it under the Anthrax Prevention Act, 1919; but as the hon. Member will be aware the disinfecting station at Liverpool was designed in the first instance on a small scale as a trial station to test the practical working of the process of disinfection, and the quantities of East Indian wool imported are greatly in excess of the capacity of the existing plant. It will not be possible, therefore, to apply the Act until the station can be extended; but pending such extension the disinfection of such wools sent voluntarily is undertaken so far as the capacity of the station permits.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 5th.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
Laboratory Meeting at the London School of Tropical Medicine, 23, Endsleigh-gardens, N.W.1.

Tuesday, March 6th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Discussion: On the Operative Treatment of Spastic Paralysis, to be opened by Mr. A. S. Blundell Bankart.
Those intending to take part in the Discussion will be furnished with an abstract of the opening paper on application to the Hon. Secretary, Mr. Gordon Pugh, Queen Mary's Hospital, Carshalton.
Cases, particularly those illustrating the subject of the Discussion, will be welcomed at 5 P.M.
NEUROLOGY: Members of this Section are specially invited to attend the above meeting, and take part in the Discussion.

Wednesday, March 7th.

SURGERY: at 5.30 P.M.
Paper:
Sir G. Lenthal Cheatle: The Sites of Origin and Methods of Growth of Fibro-Adenomata of the Breast.
Demonstration:
Dr. Ernest H. Shaw: The Immediate Microscopic Diagnosis of Tumours at the Time of Operation.
Specimens:
Mr. Frank Kidd: A Specimen of Spindle-Celled Sarcoma arising in the Mesentery of a Coil of Ileum successfully removed at operation.
Mr. Cecil Rowntree: Three specimens of Sarcoma of the Small Intestine.

Thursday, March 8th.

BALNEOLOGY AND CLIMATOLOGY: at 5 P.M.
Discussion:
Dr. C. F. Sonntag will open a Discussion on the Vagus and Sympathetic Nerves and their Relation to Climate and Hydrology. Sir William Bayliss, Dr. Langdon Brown, Dr. F. G. Thomson, Dr. Calthrop, Dr. L. Schmidt (Postyen, Czecho-Slovakia), and Dr. J. Campbell McClure will take part.
Members of other Sections are cordially invited to be present and join in the Discussion.
Members of the Section, with guests, will dine together at the Welbeck Palace Hotel, Welbeck-street, W.1, at 7.30 P.M. Those intending to be present are requested to inform Dr. Sonntag, 80a, Belsize Park-gardens, N.W.3, not later than by the last post on March 7th.
NEUROLOGY: at 8.30 P.M.
Discussion on the Treatment of Neuro-Syphilis, to be opened by Dr. Farquhar Buzzard and Dr. Henry MacCormac.

Friday, March 9th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases will be shown.
OPHTHALMOLOGY: at 8.30 P.M. (Cases at 8 P.M.)
Papers:
Mr. Humphrey Neame: Tumours of Optic Nerve.
Mr. Williamson-Noble: Orbital Endotheliomata.
There will be no meeting of the Section in April, owing to the proximity of the Annual Meeting of the Ophthalmological Society of the United Kingdom.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
WEDNESDAY, March 7th.—9 P.M., Second Lettsomian Lecture. Mr. W. E. Miles: Carcinoma of the Rectum.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
TUESDAY, March 6th.—5 P.M., First Goulstonian Lecture:—Dr. G. Evans: The Nature of Arteriosclerosis.
THURSDAY.—5 P.M., Second Goulstonian Lecture.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, March 5th.—5 P.M., Hunterian Lectures on Man's Posture: its Evolution and Disorders: Prof. Sir A. Keith. Lecture I.
WEDNESDAY.—5 P.M., Lecture II.
FRIDAY.—5 P.M., Lecture III.

FELLOWSHIP OF MEDICINE, POST-GRADUATE LECTURES, 1, Wimpole-street, W.
WEDNESDAY, March 7th.—8.30 P.M., Dr. G. Riddoch: Diagnosis and Treatment of Cerebral Syphilis.
(At the Western General Infirmary, Marylebone-road, N.W.)
MONDAY, March 5th.—Prof. Sir Wm. Bayliss: The Use of Saline Injections in the Treatment of Disease.

WEST END HOSPITAL FOR NERVOUS DISEASES.
The following Clinical Demonstrations will be held during the forthcoming Session in the Out-patient Department of the Hospital, 73, Welbeck-street, W. The Demonstrations are open to Practitioners and Medical Students without fee.
TUESDAY, March 6th.—2 P.M., Mr. Laming Evans: Orthopædic Treatment of Nervous Diseases.
FRIDAY, March 9th.—4.30 P.M., Sir James Purves-Stewart: Clinical Cases. C. WORSTER-DROUGHT, M.D., Dean.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: JAN.–MARCH, 1923.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 5th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Clinical Lecture:—Dr. Aldren Turner.
TUESDAY, March 6th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—Head Injuries: Mr. Armour.
THURSDAY, March 8th.—Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Lecture:—The Electrical Testing of Muscles: Dr. Bailey.
FRIDAY, March 9th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Cervical Ribs: Mr. Sargent.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
NEURO-PATHOLOGY.
MONDAY, March 5th.—12 noon, Syphilis of the Nervous System: Dr. J. Godwin Greenfield.
N.B.—A Course of Lectures in the Anatomy and Physiology of the Nervous System will be given if there are sufficient entries for it.
The fee for the whole Course, including Anatomy and Physiology, is £12 12*s.*; but these Lectures may be taken separately for a fee of £4 4*s.* Course without Anatomy and Physiology Lectures will be £10 10*s.* Any part of the Course may be taken separately at a special fee. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
C. M. HINDS HOWELL, Dean of Medical School.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, March 5th.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—10.30 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon, Dr. Burnford: Pathological Demonstration. 4 P.M., Dr. Pernet: Syphilitic Affections of Skin in Infants and Children.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 4 P.M., Dr. Snowden: Relation between Anxiety States and Toxæmia.
FRIDAY.—12 noon, Dr. Flett: Radiology. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose, and Ear. 3 P.M., Mr. Sinclair: Surgical Cases.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10.30 A.M., Mr. Maingot: Surgical Pathology.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., Inpatients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON CLINICAL SOCIETY, Prince of Wales's General Hospital, S. Tottenham.
WEDNESDAY, March 7th.—8 P.M., Dr. F. Tresilian: Cases from General Practice (Discussion and Cases).

UNIVERSITY OF LONDON ADVANCED LECTURES IN MEDICINE, Robert Barnes Hall, Royal Society of Medicine, 1, Wimpole-street, W.
(Course of Three Free Lectures.)
WEDNESDAY, March 7th.—5.30 P.M., Sir Archibald E. Garrod: Alcaptonuria and Ochronosis. (Second Lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.
(Course of Three Public Lectures in the Physiology Theatre.)
WEDNESDAY, March 7th.—5 P.M., Mr. A. H. Drew: The Cultivation of Tissues in Vitro. (Second Lecture.)

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.
(In the Anatomical Theatre.)
THURSDAY, March 8th.—5 P.M., Dr. J. H. Sequeira: Advances in the Treatment of Skin Disease by Light.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
MONDAY, March 5th.—4.30 P.M., Dr. T. Grainger Stewart: Demonstration of Neurological Cases.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street.
THURSDAY, March 8th.—4 P.M., Dr. Shires: X Ray Diagnosis of Diseases of the Chest.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, W.
THURSDAY, March 8th.—5.30 P.M., Dr. F. W. Price: Cardiac Arrhythmias.

HARVEIAN SOCIETY OF LONDON (Town Hall, Paddington).
THURSDAY, March 8th.—8.30 P.M., Dr. W. Hunter: Septic Anæmias.

MANCHESTER CLINICAL SOCIETY, Onward Buildings, Deansgate.
THURSDAY, March 8th.—4.30 P.M., Dr. Robert Hutchison: The Chronic Abdomen.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, March 6th.—4.15 P.M., Dr. W. F. Shaw: Treatment of Uterine Fibroids.
FRIDAY.—4.15 P.M., Dr. E. M. Brockbank: The Microscopical Examination of Blood in Diagnosis of Disease.

ANCOATS HOSPITAL POST-GRADUATE LECTURE.
THURSDAY, March 8th.—4.30 P.M., Mr. P. G. McEvedy: The Diagnosis of Tuberculous Peritonitis.

ST. MARY'S HOSPITALS, MANCHESTER. POST-GRADUATE LECTURE (Whitworth-street West Branch).
FRIDAY, March 9th.—4.30 P.M., Dr. Lacey: Treatment of Obstetric Emergencies.

MANCHESTER BABIES' HOSPITAL, POST-GRADUATE LECTURES, Slade-lane, Levenshulme.
SATURDAY, March 10th.—4 P.M., Dr. Catherine Chisholm: Discussion on the Various Methods of Arranging and Calculating Cows' Milk Feeds.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, March 7th.—4 P.M., Major A. T. Frost, R.A.M.C.: Venereal Disease under Army Organisation.

Appointments.

ARCHER, G. E., M.B., Ch.B. Manch., has been appointed Honorary Surgeon in Charge of the Ear, Nose, and Throat Department, Stockport Infirmary.

BALDWIN, C. W. T., M.R.C.S., L.R.C.P.Lond., Assistant Radiologist (Therapeutic) to the Middlesex Hospital.

GOODWIN, A., M.D. Lond., F.R.C.S. Eng. & Edin., Assistant Gynæcologist to the Prince of Wales General Hospital, Tottenham.

JEPHCOTT, CHARLES, M.B., B.Ch.Camb., M.R.C.S., L.R.C.P. Lond., Police Surgeon for the City of Chester.

M'CLURE, I. H., M.B., Ch.B. Edin., Resident Surgeon, Royal Surrey County Hospital, Guildford.

MCCULLAGH, A. C. H., M.D. Durh., to be one of the Medical Referees under the Workmen's Compensation Act, 1906, for County Court Circuit No. 2.

PICKWORTH, F. A., M.R.C.S., L.R.C.P. Lond., Assistant Pathologist in connexion with the Joint Board of Research for Mental Diseases, City of Birmingham.

St. Thomas's Hospital: STORY, A. G., M.R.C.S., L.R.C.P.Lond., COLE, L. B., M.B., B.Ch.Camb., GIBSON, C. P. R., M.R.C.S., L.R.C.P. Lond., FULLER, C. B. S., M.B., B.Ch.Camb., SUDBURY, F. B., M.R.C.S., L.R.C.P.Lond., DAVIES, D. A., M.R.C.S., L.R.C.P.Lond., HUGHES, K. E. A., M.R.C.S., L.R.C.P. Lond., CROCKFORD, A. L., M.B., B.Ch.Camb., Casualty Officers and Resident Anæsthetists; GAYDON, F. A., M.R.C.S., L.R.C.P.Lond., BAIN, C. W. C., M.B., B.Ch.Oxf., LEYS, D. G., M.B., B.Ch.Oxf., OLIVER, C. P., M.R.C.S., L.R.C.P.Lond., Resident House Physicians; PHILLIPPS, F. A., M.R.C.S., L.R.C.P.Lond., Resident House Physician (for Children); MACPHERSON, N. S., M.R.C.S., L.R.C.P.Lond., PATRICK, C. V., M.R.C.S., L.R.C.P.Lond., NICHOL, R. W., M.R.C.S., L.R.C.P.Lond., CHURCHER, J. C., M.R.C.S., L.R.C.P.Lond., Resident House Surgeons; LUND, G. S., M.R.C.S., L.R.C.P.Lond., Resident Orthopædic House Surgeon; WILLIAMS, E., M.R.C.S., L.R.C.P.Lond., NEILSON, D. F. A., F.R.C.S.Eng., Resident House Surgeons for Ear, Nose and Throat; SLAUGHTER, H. L., M.R.C.S., L.R.C.P.Lond., Senior Obstetric House Physician; SMALLEY, L., M.R.C.S., L.R.C.P.Lond., Junior Obstetric House Physician; GOUGH, J. H. H., M.R.C.S., L.R.C.P.Lond., Senior Ophthalmic House Surgeon; DOGGART J. H., M.R.C.S., L.R.C.P.Lond., Junior Ophthalmic House Surgeon; CAVENAGH, J. B., M.B., B.Ch.Oxf., NAUDE, A. L. TE. W., M.R.C.S., L.R.C.P.Lond., FRANKLIN, C. A. H., M.R.C.S., L.R.C.P.Lond., SLATER, A. E., M.R.C.S., L.R.C.P. Lond., KIES, J. P., M.R.C.S., L.R.C.P.Lond., ALLEN, H. S., M.R.C.S., L.R.C.P.Lond., FRENCH, L., M.R.C.S., L.R.C.P. Lond., LAWN, L., M.R.C.S., L.R.C.P.Lond., PAGE, E. S., M.R.C.S., L.R.C.P.Lond., MORRISON, R. G., M.R.C.S., L.R.C.P.Lond., THOMSON, T. R., M.R.C.S., L.R.C.P.Lond., FACEY, R. V., M.R.C.S., L.R.C.P.Lond., CURWEN, E. C., M.R.C.S., L.R.C.P.Lond., SWAN, G. R. M., M.R.C.S., L.R.C.P.Lond., PALMER, H.M., M.R.C.S., L.R.C.P.Lond., Clinical Assistants.

Certifying Surgeons under the Factory and Workshop Acts: BURNS, A. S., M.B., Ch.B. Ed. (Chapel-en-le-Frith District of the County of Derbyshire); ROBINSON, J. (Canterbury).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary Treatment Centre.—Jun. M.O. £500.
Ashington Hospital, Northumberland.—H.S. £200.
Ayr County Hospital.—Res. H.S. £175.
Barnet, Wellhouse Hospital.—Asst. Res. M.O. £150.
Birmingham Orthopædic Centre.—Jun. M.O. £350.
Birmingham and Midland Homœopathic Hospital and Dispensary.—Res. H.S. £175.
Bolingbroke Hospital, Wandsworth Common, S.W.—Radiologist.
Cardiff City.—Asst. M.O. £550.
Carlisle, Cumberland Infirmary.—R.M.O. £175.
Cheadle, Cheshire, Cheadle Royal.—Asst. M.O. £350.
Derby County Mental Hospital, Mickleover.—Jun. Asst. M.O. £350.
Eastbourne, Princess Alice Memorial Hospital.—Hon. M.O. for Radiological and Electro-Therapeutic Department.
East Ham County Borough.—Female Asst. M.O. £500.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. and Asst. H.S. £250 and £150 respectively.
Freemasons' Hospital and Nursing Home, 237, Fulham-road, S.W.—Res. M.O. £250.
French Hospital and Dispensary, 172, Shaftesbury-avenue, W.C.—Hon. Dental Surgeon.
Harrogate Infirmary.—Res. H.S. £150.
Hastings, East Sussex Hospital.—Hon. Asst. S.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each £50.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
London Lock Hospital, 91, Dean-street, W.—H.S. £200.
London (Royal Free Hospital) School of Medicine for Women, Hunter-street, W.C.—Sec. Asst. in Obstetrical and Gynæc. Unit. £500.
London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.
Manchester, Ancoats Hospital.—R.M.O. £200. Med. Reg. £100. H.S. £100.
Manchester City.—Female M.O. £632 7s. 8d.
Maudesley Hospital, Denmark Hill, S.E.—Pathologist. £1000.
Newcastle-upon-Tyne Hospital for Sick Children.—Sen. and Jun. R.M.O.'s. £170 and £140 respectively.
North Middlesex Hospital, Edmonton, N.—Asst. M.O. £200.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.
Oldham Union Poor-law Institution, Rochdale-road.—Res. Asst. M.O. £300.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. Surg.
Royal Chest Hospital, City-road, E.C.—Res. M.O. £200. Also H.P. £120.
Royal Free Hospital, Gray's Inn-road, W.C.—Second Ven. Dis. Asst. £100.
Royal Northern Hospital, Holloway-road, N.—M.O. to Out-patients. £150. H.P. and H.S. Each £100. Surgeon for Diseases of Ear, &c.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. M.O. £175.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.
Salford Royal Hospital.—H.P. £200. H.S. and Cas. H.S. £150 each.
Sheffield, South Yorkshire Asylum.—M.O. and Pathologist. £400.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stanmore, Middlesex, Royal National Orthopædic Hospital, Brockley Hill.—Hon. Dental S.
Sunderland Children's Hospital.—Jun. Res. M.O. £100.
Sunderland Royal Infirmary.—H.P. £160. H.S. £160.
University College Hospital Medical School, University-street, W.C.—Asst. to Professor of Pathology. £500.
University of London.—Chair of Anat. (tenable at St. Bart.'s Hosp. Med. Coll.). £1000.
West End Hospital for Nervous Diseases, Regent's Park, N.W.—Jun. H.P. £100.
West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Alnwick (Northumberland).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 17, attached more particularly to the Boston, Holbeach, Sleaford, Spalding, and Spilsby County Courts.

Births, Marriages, and Deaths.

BIRTHS.

ALLPORT.—On Feb. 25th, at Palace Gardens-terrace, W., the wife of Alfred Allport, M.R.C.S., of a son.

SALT.—On Feb. 18th, at Chirk, North Wales, the wife of Charles E. Salt, M.B., Ch.B., of a daughter.

SKIRVING.—On Feb. 23rd, at Rothesay-place, Edinburgh, the wife of A. A. Scot Skirving, C.M.G., F.R.C.S. Edin., of a son.

DEATHS.

DENHOLM.—On Feb. 19th, at Putney, London, Andrew Denholm, M.D., late of Duddington, Edinburgh, and Chorlton-cum-Hardy, Manchester, in his 72nd year.

HASLAM.—On Feb. 27th, at 8, Vicarage-road, Edgbaston, Amy, wife of William F. Haslam, M.B., F.R.C.S.

HOWDEN.—On Feb. 24th, suddenly, Ian Dalrymple Clark Howden, M.D., F.R.C.S. Edin., of Cambridge-terrace, Dover.

SMITH.—On Feb. 21st, suddenly, Peter Caldwell Smith, C.B.E., M.A., M.D., Lieut.-Colonel, R.A.M.C., T., Medical Officer of Health for Wandsworth Borough, aged 64.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

A NATIONAL APPEAL FOR REFUGEES IN THE NEAR EAST.

AN opportunity has now arisen for relief work on a reconstructive basis in connexion with the problem of the Near Eastern refugees, and an all-British appeal for funds to support this object is made by the Imperial War Relief Fund, the Save the Children Fund, and the Friends' Relief Committee. The Greek Government have allotted a district of land to about 10,000 refugees, and have supplied such building materials, agricultural implements, tools, &c., as will enable the latter to build their villages and settle permanently on the land. Food supplies which will last till the beginning of April are already in hand, but the interval between that date and the gathering of the harvest is unprovided for. The High Commissariat of the League of Nations has requested the assistance of the British relief organisations to complete and extend this work of permanent relief. The Greek Government has given assurance of the supply of essentials which will enable the refugees in this area to become self-supporting after the harvest is gathered; the relief societies associated in the all-British appeal, who are already feeding 35,000 refugees in other parts of Greece, have agreed to provide the necessary food, which will be distributed under British supervision; and, in view of the serious outbreak of epidemics, the British Red Cross Society have consented to take over and enlarge the hospital established by Lady Rumbold, and to administer medical relief over the whole of this area. The appeal is signed by the Prime Minister, the Archbishops, and other political and religious leaders. Donations, which may be earmarked, if desired, for general relief purposes or for medical relief, will be gladly received by the Lord Mayor of London, Mansion House, London, E.C. Letters should be marked "Near East Appeal."

PUBLIC HEALTH IN BRITISH HONDURAS.

Lieut.-Colonel Max Smith, Colonial Secretary of British Honduras, in a report for 1921–22, states that the outstanding feature of the year, as regards public health and sanitation, was an outbreak of yellow fever. This occurred in August, 1921, at Loyola Park, a Roman Catholic college situated about a mile from the town of Belize, and having at that time over 100 local day scholars and about the same number of boarders drawn mostly from Guatemala, Honduras, Mexico, and San Salvador. Three suspicious cases were reported by the college physician and were diagnosed the same day by Dr. Gann, P.M.O., as yellow fever. They were immediately removed to the hospital, where they died the same evening, the autopsy fully confirming the diagnosis. The next day two more cases were reported, and from August 19th to 25th 14 cases in all occurred. This proved to be a secondary infection. The first case developed on August 14th, so there must have been one or more infected mosquitoes at some date prior to July 29th. This corresponds to the time when the boarders were returning from their vacation. Yellow fever, therefore, was undoubtedly introduced from outside, as no case had occurred in the colony since 1905. In 1920 and 1921 it was prevalent in Guatemala and San Salvador, and it still exists in Mexico. Probably an ambulatory case arrived amongst the boys so slight as to be unrecognised. The authorities took prompt action. The college was quarantined and the buildings fumigated, but as further cases occurred the whole of the inmates were removed to an isolation station on one of the islands, with the result that no more cases occurred and all were returned on Sept. 23rd. Three isolated cases occurred in Belize, the last on Nov. 13th. The infection undoubtedly reached the town and it is surprising that more cases did not occur amongst a large non-immune population, many of whom were particularly susceptible. That such did not occur was in the opinion of the P.M.O. due to the Noguchi vaccine which was supplied gratis by the Rockefeller Foundation and largely used, particularly amongst the susceptible class. The serum also undoubtedly reduced the death-rate amongst the sufferers. In response to an invitation by the Government two representatives of the Rockefeller International Board of Health arrived on Sept. 29th from Guatemala to assist in the preventive measures to be taken against the disease. An energetic campaign was at once commenced, with the result that the "house index" was reduced by the end of December to nearly the safety limit; but it is costly work and at the best of a temporary nature. Belize is swampy and has no natural drainage; it is entirely dependent on rain-water for its water-supply. The only permanent solution of the danger is an adequate pipe water-supply and the raising of the low-lying parts of the town—the latter of which will help to eradicate malarial fever. One of the greatest problems of the colony is how to banish malaria. It is the pivot on which all public health problems balance. Every industry and occupation is greatly handicapped by its ravages. As Dr. Wise, in writing of British Guiana, says: "It is a blight on the land. People are poisoned with it at birth and live in infancy and childhood with a millstone around their necks." The untiring efforts to eradicate the stegomyia mosquito that carries the yellow fever germ have had some effect in reducing the breeding-places of the anopheles that convey malaria. The census taken in 1921 shows a population of 45,317—22,564 males and 22,753 females. The birth-rate for the year was 35·456 and the death-rate 24·507 per 1000 of the population. The principal causes of death in order of degree were diseases of the digestive system, followed by those of the respiratory system, and then by those classified under the genito-urinary system. Deaths from malaria gave a proportion of 10 per cent. of the total deaths, and tuberculosis accounted for 6·9 per cent. of all the deaths registered. The climate of British Honduras has the reputation of being a very unhealthy one, but facts show that it compares not unfavourably with that of other tropical countries with small European populations. Europeans leading a normal life and taking common precautions find the climate pleasant and healthy. The hottest day of 1921 was Sept. 5th, when the thermometer registered 88° F., and the coldest, Jan. 29th, 58°. The total rainfall at Belize was 85·92 inches. The colony is outside the track of hurricanes, and earthquakes are unknown. From October to January cool northerly winds blow at times.

HOW TO WRITE A MEDICAL PAPER.[1]

A GOOD deal of information has been given at different times by societies and associations, by editors, and by experienced authors, as to the writing of medical papers, and some of these instructions or compilations of advice have contained disquisitions which, however true, had little to do with the subject. The Editor of the Mayo Clinic Publications keeps severely to the point. Her 20 little chapters are excellent examples of her own rules with regard to arrangement, for each chapter states clearly its subject, begins promptly, and ends by bringing the arguments to a climax. It is not until we read the mass of detailed instructions, of recommendations, and of "Dont's," which are here brought together, that we realise how much the writer of a medical paper has to think of, if he is to tell his story or deliver his message clearly and accurately as well as grammatically. He has to follow accepted style in many details, while providing a properly revised essay with references verified and with the tabular matter rightly used. This is not at all easy. The small book is intended to help untrained and partly trained writers to prepare for publication articles that will convey information with brevity, accuracy, and clearness. We may say that the intention has been quite successful; many writers who are not untrained, and who are avowedly literary in their avocations, to say nothing of busy clinicians, will find useful information in this practical little work. Here and there the advice only applies to our American colleagues.

THE LEWBART DISINFECTOR.

WE have recently had the opportunity of inspecting the construction and working of the Lewbart disinfector, an ingenious device which, fixed to the flushing pipe of a water-closet cistern, admits of automatic disinfection of the pan after flushing, in such a way that seven ounces of water mixed with disinfectant is left standing in the pan. The chief defects of disinfectant devices in the past have been (*a*) that contrivances fitted to discharge disinfecting fluid into the cistern itself require large quantities of disinfectant and destroy the cistern by corrosion, and (*b*) that contrivances whereby disinfectant, unmixed with water, is introduced through small tubes are unsatisfactory, in that the tubes rapidly become choked, and that it is difficult to determine whether the apparatus actually contains disinfectant at any given time. The Lewbart disinfector discharges its disinfectant already mixed with water into the pipe after flushing, so that the disinfectant is not carried into the drain until the next flush; the device is nickel-plated, having nothing to be corroded. Moreover, the mixing takes place in sight, behind a glass panel, so that if the water does not become discoloured it is at once apparent that the disinfectant container above it is empty.

The chief claim made on behalf of the device is that it dispenses almost entirely with the human element; each time the chain is pulled the downrush of water depresses a lever, —as it were a trigger reaching into the pipe—which releases 5 minims of disinfectant into the mixing chamber; 7 oz. of the descending water is captured in the chamber, mixed

[1] The Writing of Medical Papers. By Maude H. Mellish, Editor of the Mayo Clinic Publications. London and Philadelphia: W. B. Saunders Company. 1922. Pp. 157.

with disinfectant, and passed out again into the cistern pipe. The human element, indeed, is restricted to the slight trouble of fixing the device—which can be done by anyone with a penknife and a screwdriver—and the necessity, occurring once in about three months in a private house, of purchasing a new container at a chemist's or ironmonger's.

The Lewbart disinfector was first introduced in South Africa, where it has won much approval from Government and municipal authorities, and private firms and individuals. It is claimed to have played a large part in the recent reduction of the incidence of dysentery in large South African towns. The disinfector is owned by the Lewbart Manufacturing Co., Ltd., of 2 and 3, Norfolk-street, Strand, London, W.C., from whom any further particulars can be obtained. It is sold retail at 35*s*.

THE ERRORS OF SPIRITUALISM.[1]

WE have received an earnest little book by Mr. James Gillingham, a surgical mechanician, in which he points out the dangers inherent in the superstitions of spiritualism. The book is written in a spirit of fervent Christianity, and the doctrines of spiritualism are stated to be the wisdom of Satan at the head of a vast principality in rebellion against God. The application of this fundamental tenet to all the manifestations of the occult with which modern life has made us familiar gives rise to positions that are distinctly piquant.

THE CHAULMOOGRA PLANT IN LEPROSY.

To the Editor of THE LANCET.

SIR,—I am sorry that Dr. G. C. Kusumbeker should have thought it worth while to question in your issue of Feb. 3rd the truthfulness of the pretty legend I related about the use of the chaulmoogra plant in leprosy in olden times and the love affairs of King Rama and Princess Piya associated therewith, communicated to THE LANCET of Jan. 13th. I did not vouch for the authentic veracity of the story and I should have been as indisposed to enter upon a critical analysis of it as I should to inquire into the truthfulness of Grimm's Fairy Tales or the fables of our old friend Æsop. Such stories lose much of their innocent pleasure and charm when dissected. A very wise and ancient king has placed on record in one of the most ancient and sacred books that there is nothing new under the sun.

I can, however, bear testimony to the fact that chaulmoogra oil was used as an external and internal remedy in leprosy over 45 years ago in the Medical College Hospital of Calcutta. My friend and talented teacher, the late Lieut.-Colonel Edward Lawrie, I.M.S., when resident surgeon of that institution as far back as 1877 used chaulmoogra oil in the out-patient department in the treatment of these cases, a certain quantity being given internally (so far as I can remember as an emulsion with lime-water) and externally as a liniment at the same time. Opinions regarding the efficacy of this treatment were expressed with much reserve.

I am, Sir, yours faithfully,

P. HEHIR,
Major-General, I.M.S. (retd.).

Athens, Greece, Feb. 14th, 1923.

MOSQUITO MISÈRE.

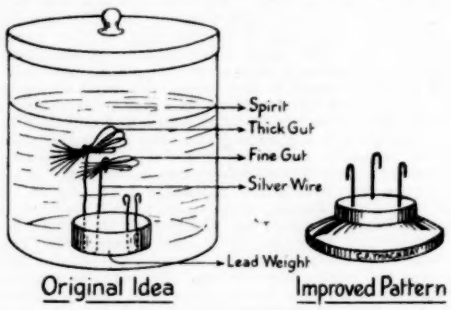
IF anyone wishes to learn how miserable life may be in the tropics with only rudimentary sanitation, or to get some idea what life was in the tropics for the old-time pioneers before tropical medicine had been developed by Ross and others, when people had to live among perennial swamps teeming with unprevented mosquitoes, he cannot do better than read Captain C. C. G. Gibson's article in the *Journal of the Royal Army Medical Corps* for January describing the experiences of 250 men of the Royal Sussex Regiment at Belize in 1919–20. The camp was at sea-level, and fortunately under the influence of the trade-wind which generally blew the mosquitoes away: but when the wind fell light these pests, and sand-flies too, swarmed, and in the hot, still, damp weather the atmosphere within an efficient muslin net was almost unbearable unless an electric fan could be fixed up inside. The barracks (wooden) were on piles, eight feet above the swampy ground, and had wire gauze windows and doors, but, owing to the holes and crevices in the warped woodwork, these screens only acted as traps to retain mosquitoes. In six months 57 per cent. of the detachment were attacked by malaria, usually, by the mercy of Providence, only mild benign tertian. During the calm weather many wore gloves and a towel or some other covering over the head and neck. "At night the men would congregate in the bathing sheds over the sea, where they would often be seen crying in their misery." This was within a thousand miles of the Panama Canal. In addition, the noise at night of the bull-frogs, crickets, croaking lizards, and other reptiles helped to banish sleep. The horses suffered badly from the mosquitoes, which gathered especially in the harness-room, so that the grooms could only do their work in an atmosphere of smouldering cocoa-nut husks which drove the insects away. It will be recalled that so long ago as 1750 Lind recommended that "smoak" should be made at night in hot countries to prevent fever. Mosquitoes, however, are not universally unpopular: spiders prefer them to flies, to eat.

[1] The Errors of Spiritualism. By James Gillingham, Surg. Mech. Frome: Harvey and Woodland, Ltd., Printers. 1922. Pp. 150. 3*s*. 6*d*.

A SILKWORM-GUT HOLDER.

To the Editor of THE LANCET

SIR,—The description of a simple and efficient silkworm-gut holder, which I gave in THE LANCET of Jan. 20th, is made clearer by reference to the accompanying diagram.



The advantages claimed are: 1. Each strand is delivered singly. 2. The gut is kept submerged in spirit. 3. One hand is left free for other work, the weight being sufficient to steady it. 4. Different gauges of gut are taken each in a distinct bundle. 5. The strands being picked up with forceps or a needle, contamination of the remaining pieces is prevented, thus is attained a more perfect degree of asepsis.

Messrs. C. F. Thachray, Leeds, have constructed the improved pattern for me.

I am, Sir, yours faithfully,

A. P. BERTWISTLE.

Leeds General Infirmary, Feb. 15th, 1923.

OPHTHALMOLOGICAL SOCIETY OF EGYPT: BULLETIN OF 1922.

THE report of the nineteenth annual meeting shows considerable activity in this Society. Sixty members out of a total membership of about eighty were present, and the bulletin contains as many as 22 short papers, mostly reports of cases. One of the most generally interesting is an account of a summer visit to the Vienna and Berlin Ophthalmic Clinics in 1921, by Dr. A. F. El Raschid Bey. Trephining for glaucoma, we learn, is nearly abandoned by most German operators now, owing to the danger of late infection. Iridectomy is the operation of choice, and where it fails, or in advanced cases, cyclo-dialysis is done. As a last resource for retinal detachment the trephine is used to make a 1½ in. hole in the sclera over the detachment, after making a conjunctival flap and evacuating the subretinal fluid by the passage of a narrow Graefe knife through the choroid. Ionisation of the cornea is used to hasten the healing of corneal ulcers and the absorption of recent corneal opacities. A good deal of importance is attributed in Vienna to the treatment of various conditions by the intramuscular injection of boiled milk, especially in purulent ophthalmia. According to a lecture recently delivered by Prof. A. J. Clark the practice of non-specific protein therapy has in some quarters gone considerably beyond any theoretical justification for it, and we have not heard that milk injections for ocular disease have been much practised in England. Another paper in this bulletin by Dr. M. Tewfik advocates the treatment.

Dr. William McNiven Muat, senior medical officer, Wei-hai-wei, has been appointed C.B.E., Civil Division.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
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ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

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